DP Close-Up

Ada

Commercial Ada Products on Horizon

By Lois Paul
CW Staff

If the fevered pace of development efforts at a number of firms involved in the Ada programming language effort and the reports from Ada watchers are any indication, commercial Ada products may be on the market sooner than has been anticipated.

Since Ada is sponsored by the Department of Defense, the Ada compilers that are developed must be submitted to the DOD for validation testing. This has been delayed somewhat because of a recent revision of the language.

The language was revised after the American National Standards Institute canvassed potential Ada users. A second canvass is under way and is scheduled to end Sept. 24. When it does, additional changes will be incorporated into Ada.

Dr. Samuel J. Lomonaco of the Institute for Defense Analysis in Alexandria, Va., and other Ada watchers anticipate that the language will be standardized by December. Full validation testing based on the revised standard will be available three months after it is set, according to John Goodenough, manager of research and development for Softech, Inc. in Waltham, Mass.

Softech is developing tests to validate Ada compilers for the DOD. "We are ready to [test] against the revised standard today, if somebody wants to do that," Goodenough said. He added, however, that Softech will not have what it considers a full set of tests until three months after the standard is set.

Full validation testing should take about two months, he noted.

Under a contract with the U.S. Army, Softech also is building the Ada Language System (ALS) for use on the Digital Equipment Corp. VAX-11 supermini. ALS is a program development system, explained Dr. Larry Weissman, manager of Sof-

(Continued on Page 8)

COMPUTERWORLD
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NEWSPAPER

It's Official: Judge Accepts U.S. vs. AT&T Settlement

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The federal government's eight-year antitrust suit against AT&T finally ended last week when Judge Harold H. Greene accepted a modified version of the settlement negotiated last January.

Greene gave the settlement his approval after a last-minute debate over one of the settlement's key provisions: whether Bell operating companies should be allowed to market terminal equipment. In January, AT&T and Justice Department lawyers agreed the operating companies would not be allowed to market terminals; Justice insisted on this provision because it felt the operating companies would otherwise have "both the ability and the incentive" to thwart competition in the terminal market.

However, on Aug. 11, when Greene ruled on the agreement [CW, Aug. 16], he

(Continued on Page 4)

Frenetic Trading Just a Big Yawn For NYSE Shop

By Tim Scannell
CW Staff

NEW YORK — Trading on the floor of the New York Stock Exchange (NYSE) has been at fever pitch the last two weeks, but in the computer center that managed the record-breaking number of transactions, the recent days have been "a big yawn."

"So far, all of that volume has been digested by the exchange trading floors and by their member firms with really no incident," Charles McQuade, president and chief executive officer of Security Industries Automation Corp. said. Siac processes all the transactions for the NYSE, the American Stock Exchange and a host of smaller, regional ex-

(Continued on Page 6)

Critics Score Immigration Bill As Step Toward Totalitarian State

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Congress has taken a first step toward making the U.S. a totalitarian state, according to opponents of immigration legislation just passed by the Senate that mandates development of a national identity system for employment purposes.

The sweeping Immigration Reform and Control Act of 1982, approved by the Senate Aug. 17, contains a controversial provision requiring employers to verify that prospective employees are entitled to work in this country. At the heart of the controversy is the fact that there must be a reliable identity system, such as a central government data base or tamperproof card issuance system, to make this provision practical.

Supporters of the legislation, which has not come before the House of Representatives for a vote, say there are adequate privacy and security controls included in the identity system provision, but opponents point to what they see as potential for misuse or abuse of any national ID system.

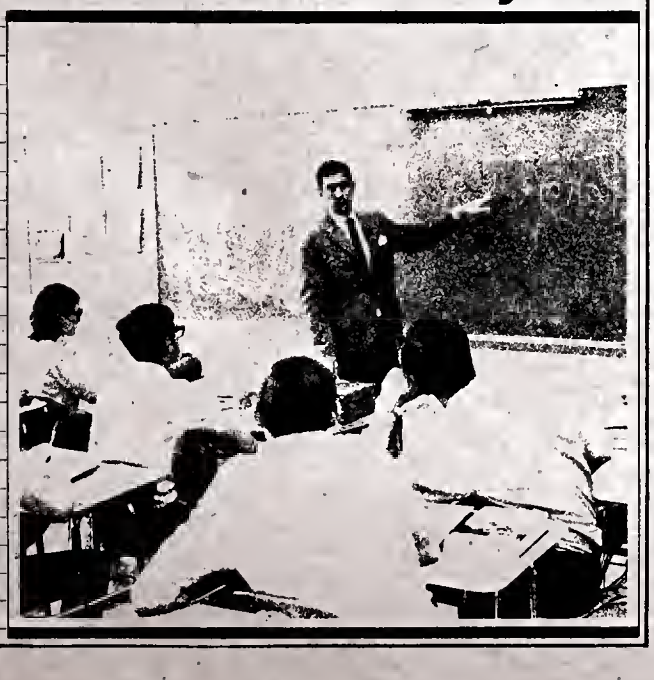
Sen. Alan Cranston (D-Calif.), in futile arguments against the bill, called the work permit system "offensive and repugnant to the concept of individual dignity and liberty . . . what more is there that a 'Big Brother' government can do to obtain control over every citizen and resident of the United States" than "to require that every American be authorized by his or her government to work?"

Cranston, one of 20 senators who voted against the bill, said that "any system that leads to the requirement that citizens be identified, no mattter how you do it or what you call it, boils down

(Continued on Page 6)

SPECIAL**REPORT**

Inside — A Practical Primer On Minicomputers And Small Business Sytems



Afcom: Operations Pros Finally 'Golden Boys,' Too

By Bob Johnson
CW New York Bureau

NEW YORK — Computer operations professionals are finally getting the same recognition in the DP community as the "fair-haired golden boys" of programming and systems.

So said Leonard Eckhaus, president of the Association for Computer Operations Managers, in his opening remarks at the association's second annual conference here last week.

Reflecting back two years to the time when Afcom was first organized, Eckhaus said that for operations managers, professional recognition in terms of salaries, promotions and industry perception was at that time almost nonexistent.

The people who moved up through the ranks to become prominent in such industry organizations as the Data Processing Management Association, the Association for Computing Machinery and in the larger user groups, such as Share, were never operations people.

"In many, many data centers, operations had always been relegated to a less important, support-type status

(Continued on Page 10)

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.

Asia: Mr. Shohei Kurita, Computerworld Japan, I-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F, Phone: (905) 514-4218, (905) 514-6309.

Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.

Denmark: Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

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Arrest Warrants Issued

Mitsubishi Workers Miss Court

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — A federal judge has issued arrest warrants for three Mitsubishi Electric Corp. employees who ignored an order to appear in court to answer charges that they conspired to transport stolen IBM trade secrets.

The warrants are expected to have little immediate impact on Deputy Department Manager Kazuma Ban, computer researcher Akira Iwase and Group Manager Chiyoji Tanaka.

All three Mitsubishi employees remain in Japan, where for the time being at least they lie effectively beyond the reach of American law. U.S. authorities have been unsuccessful thus far in their efforts to have the defendants extradited.

The warrants calling for the Japanese trio's arrest were issued here in federal district court by U.S. Magistrate Nordin Blacker, who set Ban's, Iwase's and Tanaka's bail at $250,000 each.

Blacker's recent actions bring to 12 the number of Japanese suspects who have neglected to appear in court to answer conspiracy charges stemming from the IBM trade-secrets theft case. On July 22, nine employees of Tokyo-based Hitachi Ltd. also missed a scheduled court appearance here — an omission that prompted Blacker to issue warrants for the entire group.

Like their Mitsubishi counterparts, all nine of the Hitachi employees still live in Japan, where the legal authority of Blacker's July 22 arrest orders is virtually nil.

Both the Hitachi and Mitsubishi employees stand accused of conspiring to transport confidential IBM systems information from the U.S. to Japan. The alleged conspiracy, which was exposed late last June following a seven-month FBI "sting" operation, has resulted in criminal indictments against a total of 21 individuals as well as the two Japanese companies themselves.

Altogether, Hitachi and Mitsubishi representatives are said to have paid Federal Bureau of Investigation undercover investigators nearly $650,000 in exchange for purported IBM trade secrets the buyers allegedly thought were stolen.

Many of the trade secrets take the form of various IBM technical documents, which will undoubtedly be presented as evidence in a series of upcoming trials. Until recently, the documents seemed almost destined to find their way into the public record eventually.

But on Aug. 19, U.S. Judge Robert Aguilar handed down a ruling that calls for the IBM materials to be sealed and withheld from the public.

ITT Worldcom Unveils Service Tying Digital, Analog Fax Units

NEW YORK — An upgraded commercial facsimile service claimed to be the first to interconnect digital and analog machines was unveiled earlier this month by ITT World Communications, Inc. (ITT Worldcom).

The company said its "second-generation" Faxpak network allows Group 1, 2, and 3 facsimile stations to talk to each other. The latter group encompasses digital machines, while the first two include analog devices. The equipment within each group conforms to communications protocols developed by the Consultative Committee on International Telephone and Telegraph.

Besides facsimile machines, the newly upgraded Faxpak network interfaces with telex and 300 bit/sec Ascii terminals, an ITT Worldcom spokesman said. Broadcast capability has also been added. A message transmitted once from a sender's terminal can be delivered to multiple receiving stations, and some or all of those stations can be using incompatible equipment.

Basically, Faxpak is a star-shaped store-and-forward message network connected to most of its users through In-Wats (800) circuits. There are two delivery options: "urgent," which gets the message to the recipient within 15 minutes, and "quick," which provides four-hour delivery.

The user pays 30 cent/min to deliver a message to Faxpak via an ITT Worldcom-provided In-Wats circuit. The delivery charge ranges from 30- to 40 cent/min, depending on whether "quick" or "urgent" service is specified and whether it occurs during business or nonbusiness hours. Service to incompatible terminals and broadcast service cost an additional 10 cent/min.

Corrections

The cost of Concord Data Systems CDS V.22 BIS data modem is $1,795, not $965 [CW, Aug. 16]. The vendor's correct address is 442 Marrett Road, Lexington, Mass. 02173.

The item announcing a price reduction on Data Procesing Design, Inc.'s Word-11 software package [CW, Aug. 2] should have noted that the package runs on Digital Equipment Corp. PDP-11 processors under the RSX-11M operating system and that the new price is available for PDP-11/23, PDP-11/23-Plus, PDP-11/34 and many older processors with RL01 and RL02 disk drives.

This Week

SPECIAL REPORT
Minis and Small Business Systems . . . Follows Page 54

IN DEPTH
The Birth of AIS/Net 1 27

NEWS
Bell Watchers Hoist Warning Flag Over Patents 4
Interest Withholding Rule Riles Bank DPers 5
Appeals Court Ruling Puts U.S. vs. IBM to Rest 6
DP Close-Up: Ada 8
Arco Finds It Can No Longer Ignore Micros 9
Speaker Offers Advice on Multivendor Shops 10
Law Firm Develops Own System, Nearly Sinks 11
Newspaper Challenges CDC Claims About Plato 12
American Bell Faces FCC Audit 13
DPer Gives Tips for Turning Users 'Relational' 14
Update of Relational DBMS Supports VM/CMS 15
WU Asks OK to Build First U.S. Teletex Net 16
Travel Reservation System Buoys Cruise Firm 17
Managers on the Move 18
Federal Office Expo Set for March 19
Turnaround Time 25

EDITORIAL
Editorial: Cause for Outrage 36
Softline: Micro Software 37
Human Connection: Terminal Operators 37

SOFTWARE & SERVICES
Manual Must Give User, Analyst Views 39
'SAR' for MVS Manages Sysout 40
JCL-Level Flowcharting Processes JOB SB 44
Package Automates Syslog Tasks 45
Package of Features Added to Mark III 46
Freight Subsystem Runs With 'Compu-Rate' 50
Insurance Package Fits HP 3000 51

COMMUNICATIONS
FCC Proposes Widening the Use of FM Band 55
Memorex Terminal Boasts Color 59

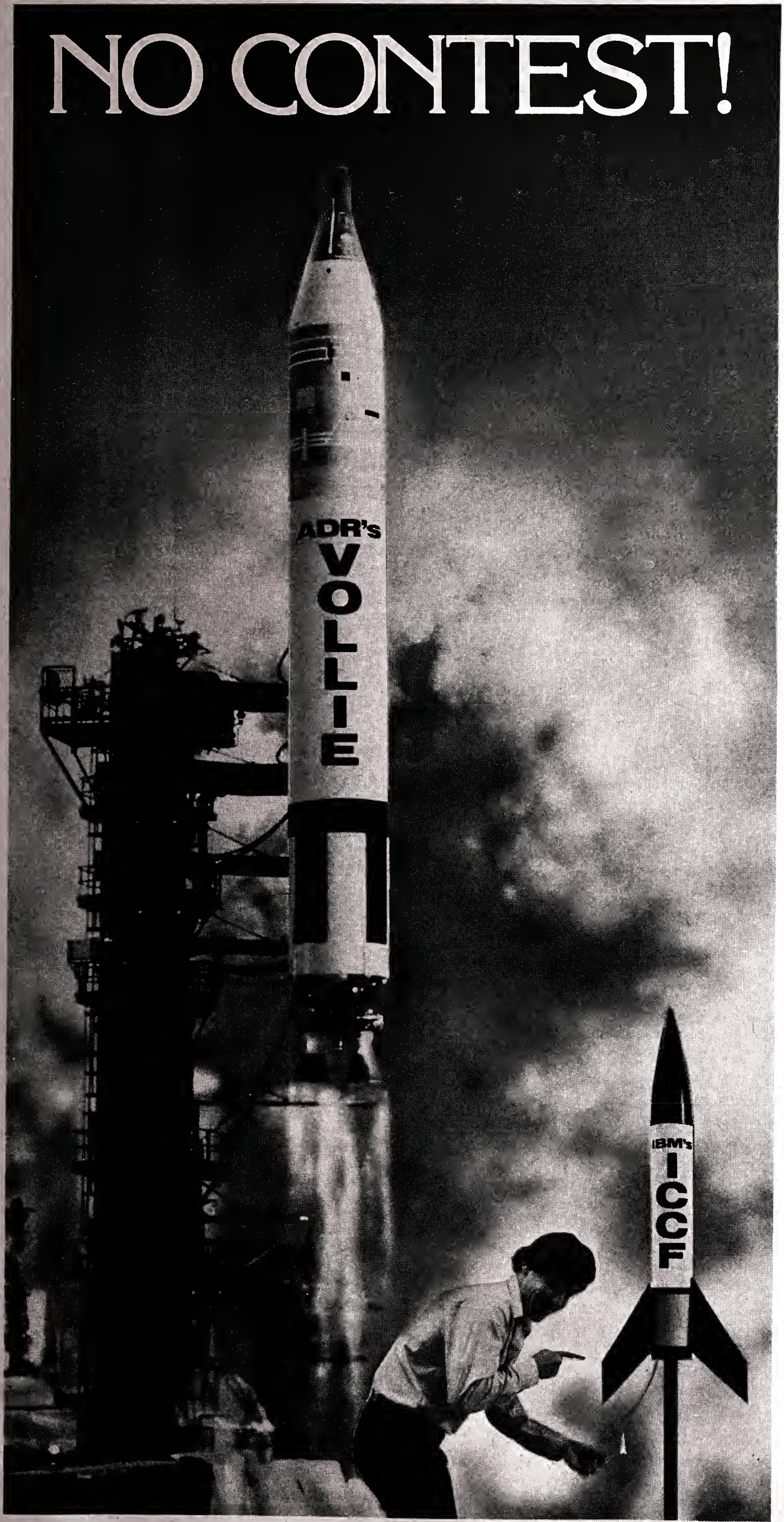
SYSTEMS & PERIPHERALS
Array Processor Matches Cray-1 Speed 61
Gould's SEL Cuts Prices 62

MINIWORLD
MDS Qantel Adds Mid-Size Processor 63

OFFICE AUTOMATION
Pizzeria Uses WP System to Slice Payroll Costs 65
9 to 5 Releases Health, Safety Guide to WP 66
Cado Cuts Prices on Office Systems 67

COMPUTER INDUSTRY
IBM Case May Alter Face of U.S./Japanese Links . . . 69
Ibis Countersues Burroughs 69
Univac MCO Completes Consolidation 70
Burroughs Plant to Close 74
When Is Software Patentable? 76
Studies Examine CAD/CAM Mart 82

ADVERTISING INDEX 108



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Bell Watchers Hoist Warning Flag Over Patents

By Bruce Hoard
CW Staff

AT&T may regain its monopolistic position in the data communications industry because of a recent "non-decision" by Federal Judge Harold H. Greene.

According to long-time Bell watchers and opponents interviewed last week, Greene's failure to insist on continued compulsory patent licensing by AT&T has created that perilous situation. The Bell experts feel the giant firm's monopolistic re-emergence could result from its refusal to renew patents and from a more aggressive attitude toward new patent protection.

The company currently licenses patents to just under 1,000 parties. It is no longer obligated by the 1956 Consent Decree to renew or sell them to would-be buyers since Greene signed a new consent agreement between the Justice Department and AT&T last week (story on Page 1).

License Worries

"I don't blame Bell competitors for worrying about patent licenses," said John Gantz, vice-president of publications at International Data Corp. in Framingham, Mass., and a veteran Bell follower. "Bell Labs has fed at the monopoly trough for close to 70 years."

Gantz said he could not understand why the Justice Department failed to demand that compulsory patent licensing be perpetuated when it agreed to settle its antitrust suit against AT&T last January. He called the omission a "loophole."

Like many Bell critics, Gantz questioned the fairness of allowing AT&T to withold technology from the public when it was the public that largely subidized its development through telephone bills. "If AT&T were to start from scratch, build new labs and hire new scientists, it would certainly be fair," he stated.

Victor J. Toth is a patent attorney who represented the Computer and Communications Industry Association (CCIA) on patent licensing during federal investigation of the issue here. "The reason for the compulsory license provision [in 1956] was to correct a very long-standing pattern of patent and patent licensing abuse being perpetrated by AT&T and the Bell system by reason of its dominant position," he said.

The patent attorney accused Greene of ignoring the fact that Bell still retains a dominant patent position. He contended that under existing patent licensing law, AT&T will be able to "re-acquire" its monopoly — or at least dominant — position through "the normal exercise of patent prerogatives in the post-modified decree era."

Toth maintained that AT&T has put itself in a position to demand unreasonable patent royalties, refuse to grant licenses and compel cross-licensing agreements with other companies. In addition, it may become more aggressive and willing to litigate patent infringement cases.

Bell Denies Claims It Could Regain Monopoly

NEW YORK — Representatives of AT&T last week denied critics' claims that it could regain a monopoly position in the data communications industry because it is no longer compelled to license and renew patents.

Addressing the question of Bell's technological base being built on the backs of rate payers, a spokesman here said they received a fair deal. "The telephone bill payers got service. That's what they paid for," he noted, adding that the company's patents belong to AT&T shareholders, not the public at large.

Allegations about past patent abuses are "baloney," the spokesman declared. "That's equating having the resources and being good enough to invent things to misusing them."

He refuted the charge that Greene has opened the door of Bell's monopolistic re-emergence by saying, "Not true. It's only disturbing for special-interest groups who have an axe to grind."

The spokesman denied Bell would be able to re-create a scenario whereby only AT&T equipment could be attached to the Bell system. That, he said, is prevented by provisions in the new decree requiring the firm to make interconnection available to everybody.

Paul Enlow, AT&T general attorney for intellectual property matters, said competition would prevent the company from charging exorbitant patent license royalties. He listed IBM and ITT as competitors with large patent holdings.

Although Enlow admitted there is "technically nothing" to prevent Bell from refusing to renew or sell licenses, he also maintained the courts would provide ample protection for any company that was unfairly discriminated against in that area.

Bell has no reason to refuse licenses, he said, adding, "People do not tend to use their patents to control things. The general rule is people in the electronics business tend to cross-license each other so the marketplace kind of establishes what the royalties for different technologies can be."

He denied that AT&T will be more aggressive in protecting new patents: "We've been pretty vigorous in the past few years. We've had quite a few lawsuits."

Green OKs Settlement; AT&T Suit Over

(Continued from Page 1)

ordered removal of all language barring the operating companies from marketing terminals, along with a number of other changes. Since the operating companies would not be manufacturing the equipment they marketed, Greene said, they would not be able to play the games of which AT&T was accused during the U.S. vs. AT&T trial.

"For example," Greene contended, "it would be quite difficult for an operating company to conspire successfully with a manufacturer to provide advance information about revised network standards or to impose interconnection restrictions which favored that manufacturer's products and no one else's."

Shortly after Aug. 11, the Justice Department, along with AT&T, accepted the changes specified by Greene. But the Justice Department asked Greene to reconsider letting the operating companies market key telephones, private branch exchange equipment and other "complex" terminal gear, presumably including data terminals.

The Justice Department's key point was that since these terminals require special maintenance, engineering and related field support, an operating company would be likely to offer a limited number of makes. "A [Bell operating company] offering the products of only a limited number of manufacturers," the department argued, "would have a strong incentive . . . to achieve supracompetitive profits" by using its control of the local exchange network to disadvantage competitors.

But Greene refused to buy this argument. Last week, after pointing out that if the Justice Department's fears were realized, the disadvantaged competitors could take the offending operating company to court, he denied the government's request. Greene added that he would "promptly" approve an amended settlement agreement containing the changes he had specified on Aug. 11 as soon as it was submitted to the court by AT&T and the Justice Department.

Last Wednesday, the revised settlement agreement was filed; two hours later, Greene approved it.

AT&T now has six months to give the Justice Department a plan for carrying out the divestiture of its operating companies and an additional 12 months to implement the plan. The first step will probably take less than six months, however, since much of the planning has already been completed. For example, AT&T announced several weeks ago that the 22 Bell operating companies would be reorganized into seven separate and independent companies.

Wide World Photo

Harold H. Greene

According to Justice Department sources, the telephone company will submit the first part of its reorganization plan, specifying the exchange area boundaries of the seven companies, within the next few weeks. The whole plan is due "before the end of this year," the sources said.

Interested parties will be asked to comment on the plan and their statements, along with the plan itself, will go to Greene. Under the agreement negotiated last January, the reorganization had to be approved only by the Justice Department before it was implemented; but now, because of a "suggestion" in Greene's Aug. 11 ruling, his prior approval will also be required.

The Federal Communications Commission will also have to approve many of the plan's provisions before they can become effective.

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Implementation Time, Costs Cited

Interest Witholding Rule Riles Bank DPers

By Marcia Blumenthal
CW Staff

"It's going to take 22 man-years to implement!" exclaimed George DiNardo, senior vice-president for information management and research at the Mellon Bank N.A. in Pittsburgh.

What has DiNardo and other bank DP executives up in arms is the interest witholding provision of President Reagan's recently passed $98.3 billion tax bill. The provision requires banks and other financial businesses to withold 10% of the interest and dividends paid to their customers. The effective date of the provision is July 1, 1983.

The provision "is going to have a major impact on both systems work and day-to-day bank operations," said DuWayne J. Peterson Jr., executive vice-president of Security Pacific National Bank in Los Angeles. Peterson and other executives interviewed last week said the systems work for updating applications to include the witholding provisions required by the government could cost individual banks $1.5 million.

Special Exemptions

Adding complexity to the task are the exemptions to the witholding regulations which the government is allowing for individuals such as senior citizens and people with low incomes, remarked Richard J. Condon, senior vice-president for DP at the Bank of New England. This means that accounts cannot be handled in an across-the-board manner.

Moreover, savings and checking accounts as well as trust accounts and other instruments that accrue interest will require separate treatment, he pointed out.

Besides questioning how to treat exemptions, bank DP executives are concerned about how to key accessing and updating the records. Account number or individual name would be two of the possibilities. In addition, methods for calculating interest are not consistent among banks.

Can't Start Yet

As yet, banks and other financial institutions are not fully aware of all the legislation's provisions and cannot begin to update their software. Many banks reported they have already established task forces to study how to approach the massive reprogramming job. Some said it would take a couple of months before their plans for updating were completely formulated.

Although banks had been hearing rumblings of a witholding requirement for years, most of the executives interviewed last week said they had not expected it to become reality. One executive, who asked not to be named, charged that the Internal Revenue Service's systems are not comprehensive or sophisticated enough to match with taxpayers' files the interest reports that banks currently submit to the tax agency. That is the reason the burden of the witholding provision has been placed on the banks, he said.

All the bank DP executives interviewed noted they will have to put critical projects on the back burner in order to comply with the witholding requirements. Besides the cost, they consider this to be the major detrimental impact of the tax bill.

Priorities on Hold

"All other priorities we have will have to be put on hold," said Tom Cook, senior vice-president of First Interstate Services Co. in Los Angeles, the DP subsidiary of First Interstate Bank. Banks are highly competitive in developing new services for customers, most of which require automation, but the witholding provision puts "all banks in the same boat," which should lessen the competitive impact, he said.

Most of those interviewed estimated revisions for between 15 and 20 applications will be involved in the reprogramming effort. This is a project that cannot be allocated to outside DP professionals, Bank of New England's Condon noted.

Moreover, the time frame for updating all programs is tight — less than a year — which may result in the creation of a "pseudosystem", according to Security Pacific's Peterson. This would be a semimanual system until the final system is shaken down.

Peterson also said banks with a large number of branches and those smaller banks that contract for outside DP services will be the ones most severely impacted by the withholding requirements.

Mellon's DiNardo estimated the new requirements will add 20% to the time it takes for a transaction as customers wait while the processor runs through the status of their interest totals.

Furthermore, DiNardo calculated that besides the reprogramming costs, his bank would incur an additional $500,000 expense annually for automation. The bank, comprised of 300 branches in 11 states, is one of the most automated of financial institutions, he said.

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Appeals Court Ruling Puts U.S. vs. IBM to Rest

By Bob Johnson
CW New York Bureau

NEW YORK — The U.S. vs. IBM antitrust suit, officially dead since Jan. 8, may have finally been laid to rest.

A U.S. court of appeals here recently ruled that the trial's former presiding judge, David N. Edelstein, must cease any further inquiries into whether the Tunney Act, which allows public scrutiny of antitrust cases, applies to U.S. vs. IBM. Edelstein must also stop an order directing IBM and the Justice Department to store all documents relating to DP products or services.

"Judge Edelstein has abused his power by continuing a lawsuit which the parties have sought eagerly to dismiss," a three-judge appellate panel stated in its Aug. 13 ruling.

The court's decision is the second part of two rulings on a petition brought before it by IBM in June. IBM asked the court to bar Edelstein from conducting any further post-trial proceedings in the case, which was dropped by the government in January.

Edelstein began inquiring in March whether the Tunney Act applied and whether consulting work done for IBM by the Justice Department's antitrust chief, William F. Baxter, influenced his decision to dismiss the case [CW, March 8]. Both concerns were brought before Edelstein by philanthropist Philip M. Stern, who submitted the motions amicus curiae, as a "friend of the court."

At the IBM petition hearing on June 17, the appeals court took issue with the allegations of bias on Baxter's part and ruled that "there is not even colorable jurisdiction in the district court to pursue any inquiry concerning the merits of the conflict of interest claim," [CW, June 28]. It decided at that time not to rule on the Tunney Act portion of the hearing, but it did not prevent Edelstein from ruling on the legal issue of the act in a hearing he held in May.

"We believe that the district court, even without ruling on the merits of the Tunney Act claim, has evinced a 'usurpation of power' and a 'clear abuse of discretion,'" the appellate court said.

Reviewing some of U.S. vs. IBM's legislative history, the court pointed out that a district court does not have limitless power in determining jurisdictional questions. It said that the dismissal of he case was presented to Edelstein on Jan. 8 and he did not take any action in regard to the Tunney Act until March.

And, the appellate court noted, although Edelstein conducted a hearing in May, he still had not reached a decision some three months later. The appellate judges maintained that Edelstein abused his power by taking that time to resolve what they felt was a "clear-cut issue."

The appellate order also mentioned several factors brought to Edelstein's attention that the judges felt demonstrated a need for a quick end to the case. Foremost among these were the huge amounts of money being spent by the involved parties to store documents pursuant to Edelstein's pretrial orders. The appellate court noted that IBM had spent $2 million in storage costs since the Jan. 8 stipulation was given to Edelstein.

IBM had no official comment other than to say that the appellate court's opinion speaks for itself, according to a spokesman for the company.

Immigration Bill Hit as 'Big Brother' Ploy

(Continued from Page 1)

to an internal passport system that sooner or later will be abused by the government."

Employer Responsibility

The verification system will initially rely on employers checking existing documents, such as passports or a combination of cards, including Social Security cards, birth certificates, driver's licenses and immigrant worker cards. The bill gives the President three years to develop a permanent identity system — possibly an entirely new system or a variation or combination of existing record systems, such as a tamper-proof Social Security card or dial-up central data base.

The bill's primary sponsor, Sen. Alan Simpson (R-Wyo.), said it "contains specifically drafted safeguards intended to minimize the risk of undue invasion or privacy and the risk of government abuse." The safeguards include provisions prohibiting the eventual IDs from being used for any purpose other than employment eligibility and prescribe criminal and civil sanctions against their misuse.

Simpson told his colleagues that testimony on the legislation before his Judiciary Subcommitte on Immigration, including that of Rev. Theodore Hesburgh, former chairman of the U.S. Civil Rights Commission, showed the "threat [to civil liberties] is not serious." However, the subcommittee was presented with an immigration report from that same commission that clearly stated any compulsory national identity system would "present potentially grave problems . . . of the infringement of individual civil liberties and the right to privacy."

Totalitarian Prerequisite

Reacting to Senate approval of the bill, a high-ranking government official who asked to not be identified remarked that "a prerequisite for a totalitarian system [is] an efficient identity system . . . There is no totalitarian or welfare system that does not have it."

In the same vein, Cranston referred to "what I have witnessed in Hitler's Germany, Mussolini's Italy and in various communist countries. The first tool of a totalitarian system is a domestic passport." Cranston said he accepted the assurances of the bill's backers, but the privacy provisions may be worthless against "some future effort by the goverment to use ID cards for nefarious purposes." He cited the 50 years of steady erosion of the initial prohibition against using Social Security numbers as universal identifiers.

All Calm at NYSE DP Shop

(Continued from Page 1)

changes. "There's been a glitch here and a glitch there, but they happen every day."

Spurred by the prospect of an upcoming bull market, institutions and individual investors recently flooded the market with transactions that sent trading volumes to record levels. In the first hour of trading on Wednesday, Aug. 18, the NYSE fielded buy orders for some 37 million shares of stock, topping the previous record of 24.1 million shares set on March 25. By the end of the same day, 132.7 million shares had been traded, setting a new record. Last Tuesday, the market reached the 122 million share mark — the second highest level ever attained.

Continual Upgrades

Through it all, the army of computer systems at Siac performed without skipping a programming breath, McQuade claimed. The reason in one word is upgrades — continual upgrades that have kept the massive system far ahead of any bottleneck problems.

"Over the past several years we've been building up to a plateau where we've got the horsepower in place to be able to take these kinds of volume surges," Siac's director observed. The past few weeks "have been the closest to a real, legitimate, sustained test we've had in the past several years. And it looks great."

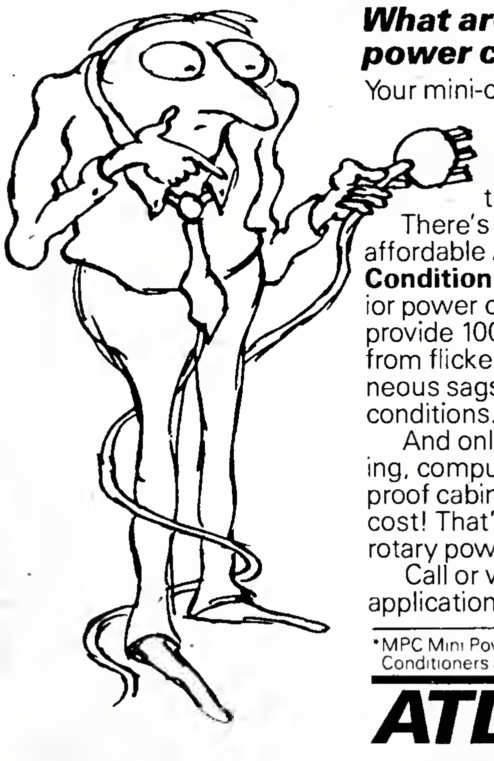
The Siac system, which has been in existence for about 10 years, consists of two IBM 370/158s; a 370/148; two IBM 3033s, added within the past two years; two 4341s, which replaced two aging IBM 360/50s; four Sperry Univac mainframes, two 1100/82s and two 1100/60s; nearly 40 Digital Equipment Corp. PDP-11/05, 11/45 and 11/70 minicomputers, and about 70 Tandem Computers, Inc. transaction-oriented minicomputers. The system also includes a number of Collins Radio Group computers that support the message-switching capabilities of the Univac machines, McQuade stated.

The hub of the operation is the Market Data System, which handles all the reporting and transactions and quotations occurring on the floor and then reroutes them through the system back to the ticker and to various exchanges across the country. This system was upgraded as recently as late last year. However, "all the systems have been expanded to adapt to heavier volume," McQuade pointed out.

Victor Ricciardelli, director of market operations for the Amex and on the receiving end of Siac's services, reported he was very pleased how the computers operated. "There were no queues whatsoever at any point in time during the high volume."

Both Ricciardelli and McQuade admitted that the computers supporting the NYSE, the Amex and other exchanges have a physical limit of the amount of trading volume they each could handle. However, neither would divulge exactly where that limit lies.

Mcquade did say that the Siac system could handle a sustained capacity of about 150 million shares per day, but would probably go well beyond that because no one exchange could theoretically keep at that level. "We did not come anywhere near our capacity last week," Ricciardelli said. "We are very conscious of capacity and are continually updating our systems."



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Who Will Use Ada?

By Lois Paul
CW Staff

Who will be the ultimate users of the Ada programming language?

Although Ada was designed to support computer applications for embedded military systems, one of its first uses has been in the development of a payroll program.

Intellimac, Inc., a Rockville, Md., firm that is a beta test site for Telesoft, Inc.'s Ada compiler, is using Ada to develop business applications on its own Motorola, Inc. 68000 microprocessor-based system. The software developed by Intellimac runs on this same micro-based system.

The first user of Intellimac's Ada-based payroll package, Intellimac is a bus and truck manufacturer in North Carolina. Ralph E. Crafts, vice-president of operations and marketing for Intellimac, said plans call for immediate installation of an automated parts inventory control system for the same company, as well as eventual development of an integrated manufacturing package written entirely in Ada.

"We got hold of the Telesoft compiler last June. Between that time and October, we worked a lot with the compiler. We made a conscious decision in October of last year to use Ada exclusively for commercial software development," Crafts explained.

What they saw of Ada convinced Crafts' technicians that Ada was "by far a superior commercial language over Cobol, Fortran, PL/I — you name it."

Self-Taught Staff

Crafts said the language is easy to learn and his staff is entirely self-taught. "I had one guy in here who was 38 years old and had been programming in Basic for 20 years. He was producing good Ada code in three days.

"Having an Ada capability is definitely an incentive for getting well-qualified programmers to come on board," he added.

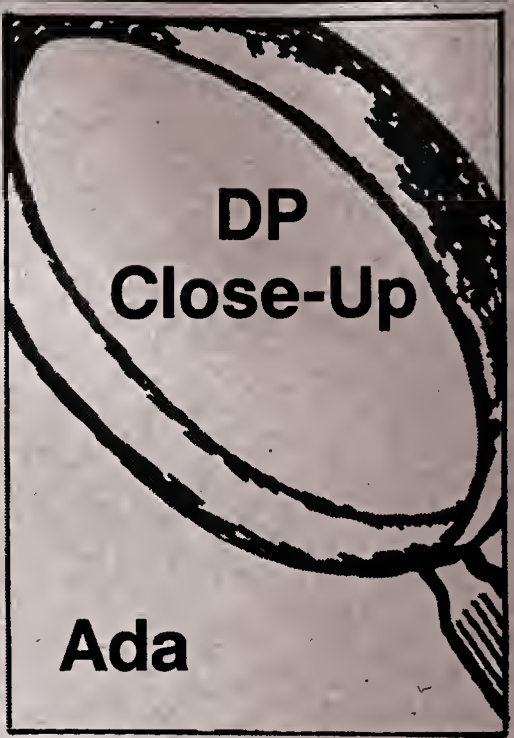
Referring to the initial use of Ada for Intellimac's payroll program, Intermetrics, Inc. Senior Staff Member Dr. Benjamin M. Brosgol said Ada is being used more as a general-purpose language because it has a lot of facilities for building large programs.

"Ada has quite a bit to offer," Brosgol said, "especially in the area of portability." It was designed to allow programming in a relatively machine-independent fashion, Brosgol continued, contrasting this with the problems encountered when trying to get Fortran programs for one system to work with a different vendor's system.

"I think there is a definite emphasis on productivity, which might be one of the key points why Ada might pick up in areas where other languages have problems," he added.

Although Western Digital Corp.'s soon-to-be-announced Ada compiler will initially target defense contractors, the firm's director of communications, Jonathan Shafer, said the company feels "there is also a tremendous commercial marketplace, first in Europe and eventually in the U.S. Or perhaps more quickly in the U.S. if the appropriate tools are available.

"Ada is a terrific language for embedded computers, which is really not much different from, for example, computers in the industrial automation world," he said, adding, "The real-time capabilities of Ada as a language — multitasking and so forth — make it ideal for industrial applications."



Tutorial, Conference on Ada Slated for October in Virginia

ARLINGTON, Va. — If you are interested in obtaining more information on Ada, an Adatec Tutorial and Conference will be held here in October.

The conference is being sponsored by the Association for Computing Machinery's Adatec committee on Ada, which is part of its Special Interest Group on Programming Languages. Adatec has 1,200 dues-paying members, according to its chairman, Robert Fritz, an Ada systems programmer at Telesoft, Inc.

The conference will be held Oct. 4-8 at the Hyatt Regency Hotel in Crystal City, Arlington, Va. The registration fee for the full conference and tutorial is $305 for those who are members of both ACM and Adatec members; $330 for those who are members of either ACM or Adatec; and $350 for others. There are reduced fees for attendance at the conference or the tutorial only and for students.

Further information can be obtained by writing to the conference chairman, Anthony Gargaro, at Computer Sciences Corp., 304 W. Rt. 38, Moorestown, N.J. 08057.

Commercial Ada Coming

(Continued from Page 1)

tech's Ada Department. The VAX version of ALS will be delivered to the Army in December; the Army will be able to release it to its contractors probably in the middle of 1983. It will represent basically an implementation of the old version of Ada with some elements of the new version.

Compilers From California

Western Digital Corp., based in Irvine, Calif., is planning to bring out an Ada compiler for its 16-bit desktop software development system, The Supercomputer, within 30 to 45 days, according to its director of corporate communications, Jonathan Shafer. The compiler reportedly will implement the most recent version of Ada.

Shafer feels that the fact that Western Digital will be introducing an Ada compiler running on a 16-bit machine, with hardware and software available together for a price in the $30,000 range, will answer some of the criticisms of Ada as being too large and too complex.

In San Diego, Calif., Telesoft, Inc.'s Ada compiler for IBM and plug-compatible systems is in beta testing, according to Marketing Manager Karen Olmscheid. The completed compiler is expected to be submitted to DOD for testing and validation by December.

Peter Dine, president of Telesoft, indicated that the release date of his firm's Ada compiler will be determined by the availability of the new version of Ada from the DOD.

A Positive Sign

An extremely positive sign for Ada watchers is the interest that IBM has expressed in the language, observed Ralph E. Crafts, vice-president of operations and marketing for Intellimac, Inc. After a February visit from Jean E. Sammet, manager of IBM's Division of Software Technology, Intellimacs was invited to make a presentation in May to a national symposium of IBM technicians.

"There is a big corporate commitment in IBM to Ada in the commercial applications area," Crafts said. "Our talk was restricted to the use of Ada in commercial applications development. When IBM has that type of interest, where they will take two to 2½ hours of very high-level managers' time on a national level to talk about Ada in the commercial environment, I feel very good about the decision we've made."

The Cambridge, Mass.-based Intermetrics, Inc. is working on the design and implementation of an Ada Programming Support Environment for the U.S. Air Force, senior staff member Dr. Benjamin M. Brosgol said. This is at least a two-year project that will include compilers and a number of tools developed on and for IBM 370 systems.

Intermetrics' Ada development effort will implement the most recent version of Ada and is scheduled for completion in the fall of 1984.

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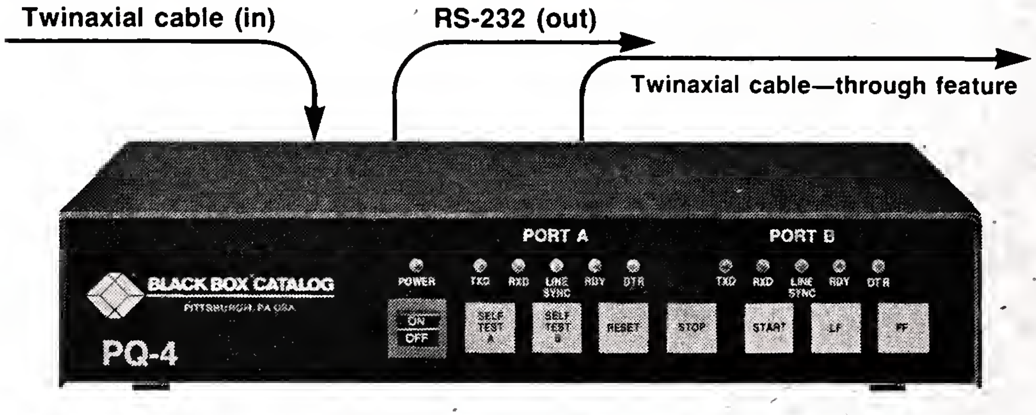

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Grappling With Long-Range Plans

Arco Finds It Can No Longer Ignore Micros

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — A major U.S. oil company has identified business microcomputing as a force it can no longer afford to ignore and is grappling with the difficult question of how micros fit in with the firm's long-range plans.

Until fairly recently, the Petroleum Products Division of Atlantic Richfield Co. (Arco) equated personal computing primarily with home hobbyists and regarded microcomputers as little more than fancy technological toys. Today, however, the company recognizes micros as a business phenomenon to be reckoned with and is plowing a small share of its systems research budget into an in-house study of personal computing's benefits and drawbacks.

The study has given Arco extensive first-hand experience with an assortment of popular microcomputer models and is helping the firm decide whether very small systems will someday provide an effective alternative to more centralized computing methods.

Arco's experiments in in-house microcomputing began about two years ago with the company's dawning realization that business-oriented personal processors were poised on the brink of an explosive growth in user popularity. "We felt very strongly that [the proliferation of commercial microcomputers] was definitely going to happen, and we knew that if we failed to act soon, we would lose all control over how the machines were going to be used," recalled Steve Jenner, Arco systems consultant. "We wanted to find out as much about small systems as we possibly could so that if someone within our company asked us what the machines could be used for and what their main problems are, we could provide them with some reasonably intelligent answers."

Cautious Experimentation

At first, the firm's experiments in in-house microcomputers proceeded cautiously; even today, the company's estimated micro systems population probably totals no more than 100 or so units. Many of the machines are currently undergoing testing in one of four Arco departments — Computing Research, Toxic Substances, Corporate Systems and Solar Research.

Within all four in-house organizations, the corporation has had an opportunity to experiment with a variety of commercial microcomputer systems, including Hewlett-Packard Co. HP 125s, IBM Personal Computers, Apple Computer, Inc. units and Osborne Computer Corp. Model 1s.

For the most part, the machines have yet to find their way into full-fledged "production" environments. Instead, the systems have been used primarily for generating presentation graphics, doing word processing and developing accounting and other types of business programs.

In addition, Jenner said, both the Computing Research and Toxic Substances departments have enjoyed a "surprising" degree of success in using their in-house micros to develop relational data bases and keyboard-search facilities.

Few Problems

Thus far, Arco's limited foray into business microcomputing has encountered few if any serious, unforeseen problems. In both its hardware and software, the company's personal computing systems have provided a higher level of performance and reliability than its users originally anticipated. The firm has been especially encouraged by the high quality of its microcomputer software.

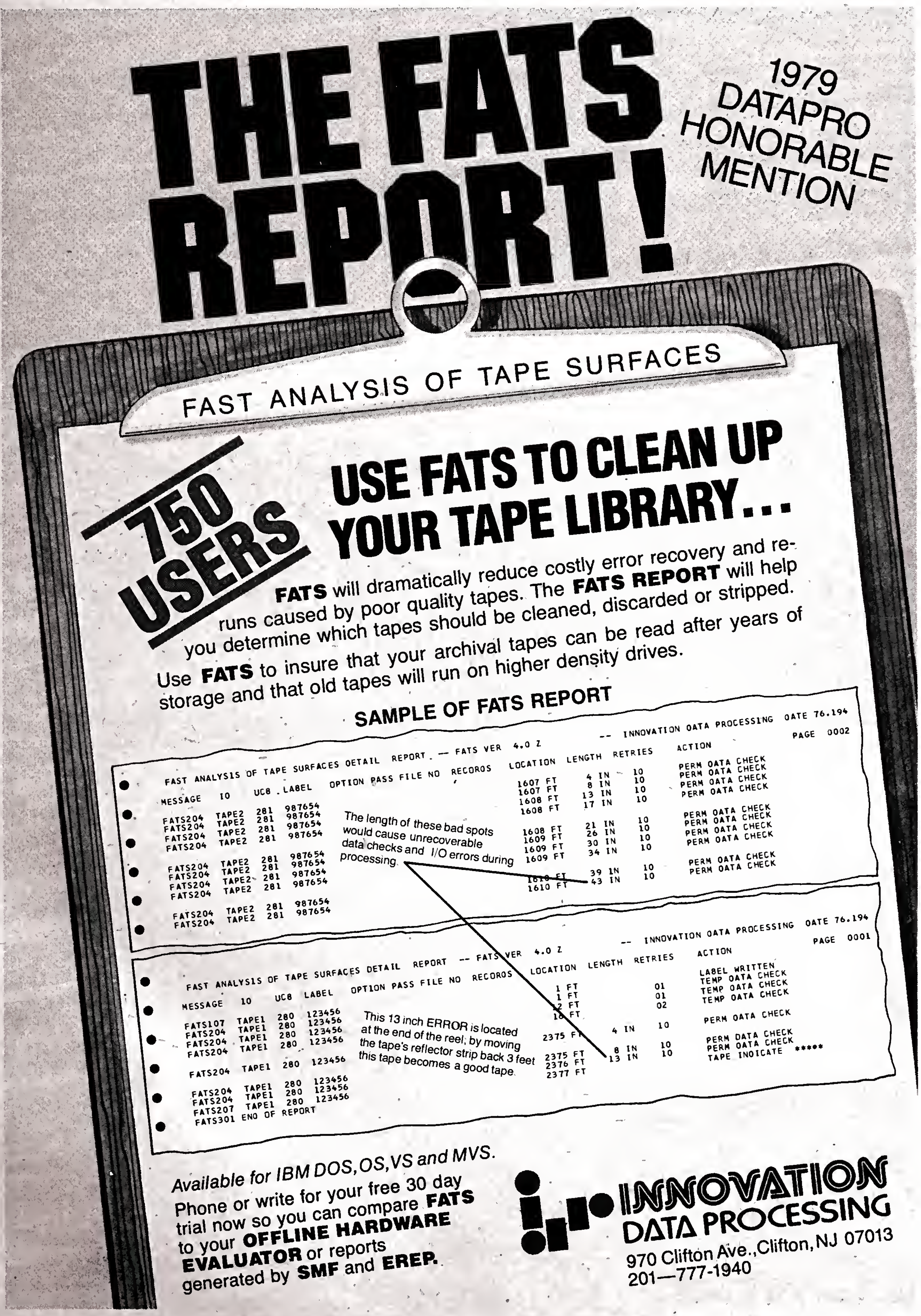
"A couple of years ago, we were concerned that the software out there in the market was not particularly good, that it lacked overall integrity," Jenner said. "For example, we envisioned situations where we would be right in the middle of an important job, and suddenly we would get a blank screen without having even the slightest idea why.

"But so far, many of these types of concerns have been partially, if not totally, dispelled. The performance of our microcomputer software has generally been quite reliable."

Despite the company's initial successes, however, business microcomputing still has a long way to go before it receives Arco's wholehearted, unqualified endorsement.

Much more research will have to be conducted before Arco can intelligently decide whether to expand the extent of its microcomputer use.

"Our tests involving business-oriented personal computers have been moving quite slowly and will probably continue to do so for the foreseeable future," Jenner said. "That way, if we do run into unexpected problems we can't overcome, we can still cut everything off. But as we get more and more familiar with in-house microcomputers, we will find one of two things: Either all our fears will be allayed, or we will encounter some pretty serious pitfalls that will force us to withdraw."



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Speaker Offers Advice on Multivendor Shops

By Bob Johnson
CW New York Bureau

NEW YORK — What decisions face operations managers considering a conversion from a single-vendor shop to a multivendor environment?

There are several major areas that can virtually make or break a multivendor shop, according to George R. Balascak, manager of information processing at Sea-Land Industries, Inc. Speaking at the second annual Association for Computer Operations Managers (Afcom) conference here last week, Balascak listed equipment delivery, price, reliability, serviceability and potential impact on operations as critical factors for the operations manager dealing with multiple vendors.

An operations manager usually begins contemplating a move to another vendor as a result of slow equipment delivery from his current vendor, according to Balascak. "One of the main reasons companies become mixed-vendor shops is because they can't get what they need when they need it. Sea-Land was a total IBM shop until the mid-1970s, when we had problems getting memory for our CPU. Naturally, we went somewhere else."

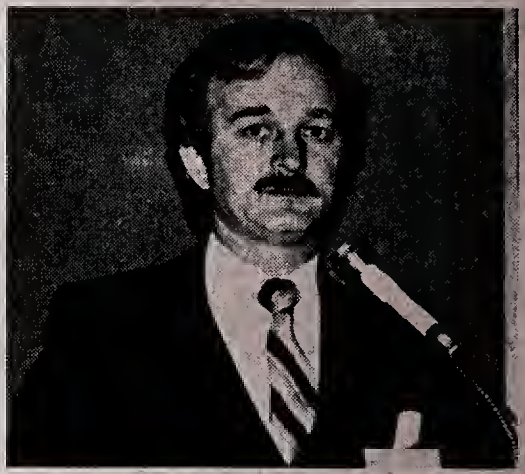
There is often a hidden benefit connected with hardware delivery problems. When these problems become the catalyst for change, managers often realize a product price reduction that can amount to substantial DP budget savings, he said.

Balascak pointed to one change of CPU vendors in which he was involved. "We realized a savings of nearly $1 million over a four-year time span after we changed vendors. This type of cost savings becomes an attractive reason for change."

Even if an equipment change can result in a cost savings, the manager should not assume its reliability will be as good as his previous equipment, Balascak warned, stressing that the operations executive must fully understand what another vendor can do to benefit his shop beyond a dollar savings.

Another way of checking on a potential new vendor involves breaking away from the company's sales force as quickly as possible, according to Balascak. He advised talking to the vendor's hardware, software and service staff directly because they are the people who are really behind the product. The service manager is the most desirable person with whom to develop rapport because "it's the service organization that keeps you alive," he maintained.

Equipment serviceability is as important as reliability when switching or adding vendors, he continued.


CW Photo by B. Johnson
George R. Balascak

"Of course, if you're thinking about installing a new vendor's printer you're not going to be very concerned with immediate on-site service."

Balascak added that the operations manager should find out how many other shops in his area have similar equipment, as well as where customer engineers are located and where spare parts come from.

The impact a new vendor makes on a shop also has to be considered, Balascak pointed out. The manager must weigh factors including his relationship with the new vendor, whether there is sufficient staff to handle various vendors and whether a primary vendor would ignore an emergency in order to "teach you a lesson. He has got to be able to stand on his own two feet if the primary vendor gets mad," he said.

Operations DPers Gain Due

(Continued from Page 1)

than the 'golden boys' in software," Eckhaus said. "The industry perceived us as assembly-line workers who always got the job done. They reasoned that if the job always got done, how difficult could it be?"

The operations area traditionally hired people with less formal education, trained them and then lost them to programming. He said that operations basically accepted the concept of a practice begun years ago by major computer companies that gave two different entry-level tests: If someone passed the more difficult test, he was hired as a programmer; if he passed only the easier one, he became an operator.

"We accepted these types of distinctions and allowed them to flourish," Eckhaus said. "We let our standing and status in the DP community sink."

However, changes have come to the operations area, the Afcom president said. There is now an association, a publication, conferences and seminars dedicated to operations.

"We are making an impact. At the last DPMA conference a small but entire section of the conference was devoted to operations for the first time," Eckhaus noted.

In addition, two of the speakers at the Afcom conference presented ACM guidelines for obtaining an associate's degree in computer operations. "Here is a major association, the ACM, not only giving some priority to operations, but actually supporting the need for a degree," Eckhaus said.

Moreover, Eckhaus said he was asked to speak on computer operations and its involvement in software maintenance at next year's National Computer Conference, reportedly the first time an operations person has been asked to speak at NCC.

The Afcom conference drew attendees from 37 different states and from Canada; Eckhaus said he felt it was quite a turnout, considering the hard economic times.

CW Photo by B. Johnson
Leonard Eckhaus

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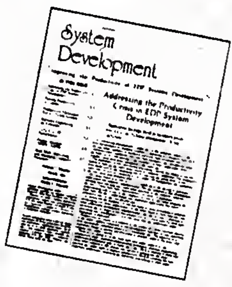

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Untrained Attorney Writes Software

Law Firm Develops Own System, Nearly Sinks

By Jeffry Beeler
CW West Coast Bureau

OAKLAND, Calif. — An unorthodox law firm with an abiding faith in the benefits of computing nearly drove itself out of business as a result of a costly and ill-conceived effort to automate its operations.

Since its founding five years ago, Yanello & Flippen has poured an estimated $200,000 into four in-house minicomputer systems, three of which were promptly scrapped for falling short of the firm's original expectations, area sources said.

In theory, the systems were supposed to trim the company's overhead by streamlining previously inefficient operations and boost the firm's profitability by attracting additional sources of income. In practice, however, the systems often did just the opposite.

Chief among the systems' weak links was their software, much of which was written by Yanello & Flippen co-founder Ralph Yanello. In addition to costing more to develop than the firm had anticipated, the programs were marred by extensive defects that often hindered the company's ability to conduct routine business, two local sources said.

In some cases, programming flaws resulted in serious billing delays and otherwise impeded the firm's efforts to collect payments from its clients, sources said. The result was that the systems slowed the company's revenue flow and at the same time added to corporation expenditures, Yanello said in a recent interview.

Caught in the resulting financial pinch, Yanello was forced recently to file for personal bankruptcy and to pare his company's operations significantly in an attempt to economize.

Today, the worst of the firm's fiscal hard times appears to be behind it. Spurred by a recent corporate reorganization and by assorted cost-cutting measures, Yanello & Flippen is slowly beginning an economic comeback.

For the last six months, the company has managed to turn a profit — a feat that prompts Yanello to speak confidently of his creation's long-term survival prospects. "We have no intention of folding our tent," he said.

But the road to partial financial recovery has proved long and difficult, forcing Yanello's law offices to make some painful business sacrifices. Particularly hard to swallow was the company's recent decision to curtail its heavy use of local TV advertising — a rare expense item indeed in the usually staid legal profession.

By no means were the firm's financial reverses entirely attributable to its faulty software. High office overhead and a hefty advertising budget contributed heavily to the company's descent into near-disaster.

Probably no factor, however, played a greater role in the organization's undoing than its programming and the resulting operational foul-ups. "What buried us," Yanello recalled, "was our inability to track our clients, find out who owed us what and collect our payments quickly."

Attorney Blames Self

Blame for the firm's defective billing system and its poorly written programs rests primarily with attorney Yanello, who insisted on developing much of his company's software himself, even though his technical background is nonexistent.

"I don't blame anyone but myself for the failure of our software to operate properly and on a timely basis," he said. "In retrospect, there are a lot of things I could have and should have done differently in an effort to get our systems up and running."

The roots of the company's software difficulties can be traced back to 1977, when Yanello & Flippen opened its doors for business and almost immediately gained a reputation as an iconoclast among U.S. law practices. What distinguished the firm from its more conventional counterparts was its decision to specialize in the relatively avant-garde field of mass-market legal services.

By definition, a company in Yanello's chosen field of endeavor seeks to attract as large a client base as possible and bring legal services within the financial reach of ordinary consumers. To accomplish those dual ends, Yanello & Flippen decided almost from the outset to take full advantage of two crucial but nonlawyerly resources — TV advertising and high technology.

Through the application of in-house minicomputer systems, Yanello reasoned, a law practice could easily improve its attorney productivity by 400% to 500% and then use the resulting savings to trim its fees.

Convinced that he could lead his company and the rest of the legal profession into a technological renaissance, Yanello began during the late 1970s to hunt for a low-end minicomputer-class system, which could combine a hard-disk unit with the ability to do both billing and word processing. The reason he specified hard-disk capability is that his firm requires a huge storage capacity to support its high-volume business.

After experimenting unsuccessfuly for four months with a Norelco Corp. word processing system, Yanello searched in vain for a product that could meet his company's peculiar combination of cost, configuration and performance requirements.

"At the time, no vendor that I had ever heard of offered a system that had a hard disk and could process both words and data in a single box," he recalled. "The only exceptions were very big systems costing $100,000 and up, which a small company such as ours just couldn't afford to pay."

After junking the Norelco gear, Yanello acquired a Wang Laboratories, Inc. word processing system, wrote his company's billing programs himself and then tried to merge the two. But Yanello's do-it-yourself programming efforts are said to have failed miserably and quickly created problems. At times, bills were mailed to their recipients several months late. On other occasions, clients were billed twice for the same legal services.

"I remember times when people would call us up and roar with anger" over inaccuracies on their bills, a local source said.

The problems and complaints finally became so serious that Yanello decided about 2½ years ago to replace the Wang system with a Digital Equipment Corp. PDP-11/34, which the law firm continues to use. But the arrival of the DEC equipment has failed to remedy all the company's ills. Although the machine is suitably programmed for billing, it still lacks the necessary software to do Yanello's word processing.

"Now that I have the benefit of hindsight, I realize I probably should have switched to a service bureau as soon as I knew I was going to have to move from the Wang equipment to something bigger," he said.

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Newspaper Challenges CDC Claims On Effectiveness of Plato Education System

By Dennis Schapiro
Special to CW‡

MINNEAPOLIS — A newspaper investigation has challenged claims made by Control Data Corp. regarding the effectiveness of its Plato computer-assisted instruction system in helping elementary school low achievers.

CDC spokesmen strongly criticized the investigation, but refused to release studies that they said support CDC's claims.

Plato usually operates through a terminal tied to a mainframe computer via a telephone line, giving the student potential access to more than 12,000 hours of courses. CDC officials maintain that more than $900 million have been invested in Plato since research began in 1962.

Gregor W. Pinney researched and wrote the article that appeared on the front page of the Aug. 22 Minneapolis *Tribune* under the headline, "Studies Don't Confirm Claims For Plato's Teaching Success." Pinney studied the test records of 37 low achievers in Knox School, an elementary school in a low-income area of San Antonio, Texas, who used the basic skills curriculum offered through the Plato system. Based on his analysis of the data, he wrote that ". . . test scores at Knox did not show that Plato helped most kids in the long run.

"Besides failing to improve average test scores in the long run, Plato seemed to do little to improve the students' grades in the classroom."

Pinney contrasted the results of his study with claims made in CDC advertising that Control Data Learning Centers can "guarantee" success, that students could achieve "a year of academic progress after 30 hours on the machine" and that gains made while using Plato would persist after the program had ended. CDC's 115 learning centers are not affiliated with public schools, but they use the same Plato terminals and programs that were used in San Antonio.

The article stated that CDC had produced studies showing "older customers" had benefited from Plato. CDC's refusal to provide studies to substantiate the claims for low-achieving children inspired the research that led Pinney to San Antonio and Los Angeles.

Requesting Proof

Pinney said he asked officials of the Twin Cities-based computer firm in 1980 to provide information to back up advertising claims "because the advertisements promised such good things. Whenever I hear about a miracle cure in education, I get interested in it."

A CDC official said that the company delivered "about 15 pounds of paper." Pinney did not find among the studies sufficient proof to support the claims. Since last May he has spent between 75% and 80% of his time investigating Plato's effects on children.

Pinney reviewed studies performed in Palm Beach County, Fla., Baltimore and Los Angeles. The results were mixed and the methodologies open to question, the newspaper article reported.

Focusing on San Antonio, Pinney looked at 53 cases — 16 of the 37 children were counted twice because they took both mathematics and reading courses. Based on test scores, he concluded that fourth and fifth graders generally improved their performance slightly while using Plato, but slipped back soon after leaving the program. As a result, their scores on standardized tests at the end of sixth grade were approximately what might have been projected had they not used Plato.

CDC issued a statement criticizing the study's focus on "one small segment of the broad scope of Plato computer-based education" and "inadequate research methods that significantly inhibited the ability to draw valid conclusions." CDC officials had asked to have the research reviewed by "a third party knowledgeable in the area of testing and measurement," but the request was denied.

"We stuck with what we had," said Pinney, who has covered education for 12 years but has done no other original research. "I stand by my research. It was a good job. There is no way you can take the figures and make them come out much different."

However, according to William Shaffer, general manager for communications at CDC, Pinney "extrapolated." Contacted by telephone last week, Shaffer said Pinney "used some pretests taken after the kids had started on Plato and some posttests taken six to 11 months after they had finished, and every combination in between. It was a very heterogeneous technique.

"Also, we are not marketing Plato to the public schools using the ads he mentioned," Shaffer added. The "guarantee" and other advertising claims cited in the article, Shaffer said, applied to learning centers but not to public school installations.

It is reasonable to expect that the controlled environment and parental support evident to students when they enroll in a learning center could produce results that might not be found in a public school classroom.

Shaffer also emphasized that Plato is not meant to replace teachers: "It supplements them. The study is not fair to the teachers of San Antonio. It says that they failed. They were dealing with profound educational problems there, and Plato is one tool they were using."

CDC officials say they have studies showing Plato's effectiveness. In a statement issued last week to rebut the *Tribune* article, they said, "Because of our concern over the . . . *Tribune*'s questionable research methodology and . . . ambivalence toward third-party review, it was especially inappropriate to disclose our research to the reporter."

Shaffer said the studies were not released in order to protect the privacy of individuals and to live up to other contractual obligations with researchers. "Pinney got the studies we were allowed under law and contract to give him," he said. He added that "more than 100" studies of Plato have been done and more than a dozen on the basic skills curriculum. He described some as relatively rigorous, some involving control and experimental groups, pre- and posttesting and comparison to standardized norms.

"They show," he said, "significant learning advancement, significant gains in literacy at a rate faster than traditional education."

Expert Says Research on Plato Raises Questions

Special to CW

MINNEAPOLIS — Had the Minneapolis *Tribune* and Control Data Corp. agreed to call in "a third party knowledgeable in testing and measurement," as CDC said it requested, Dr. Michael Patton might have been a reasonable choice. A University of Minnesota sociologist, he is a former director of the Minnesota Center for Social Research and the author of four books on evaluation research.

"By no means is the data in the [*Tribune*] article complete," Patton said. "It would be inappropriate to consider the research definitive. But it does what it ought to do. It raises questions about the extent and generalizability of Control Data's claims. Too much should not be made of the research — but that is different from dismissing it.

"Control Data's advertising appears to be public relations and not based on research at all . . . a kind of universal advertising hype. If Control Data says it can guarantee a year of progress with 30 days in the program, it is implying a research base and it has not produced evidence in support of it. That type of claim would be hard to support."

Patton questioned CDC's argument that the reports are being withheld to protect privacy. "That's the ultimate stonewalling . . . there is no ethical or substantive reason for not releasing reports — other than not having favorable results. There are no principles in science or evaluation research against releasing results.

"The burden of proof," he continued, "is on Control Data. They have said to educators around the country that they can deal with a serious problem. Under those conditions, with dollars and kids' lives at stake, the burden is on them to prove what they say is true."

William Shaffer, general manager for communications at CDC, said, "The responsibility rests with us. We are exercising it this way in the interest of the privacy of the people involved. It's a tough sell. I guess you've got to take it on faith."

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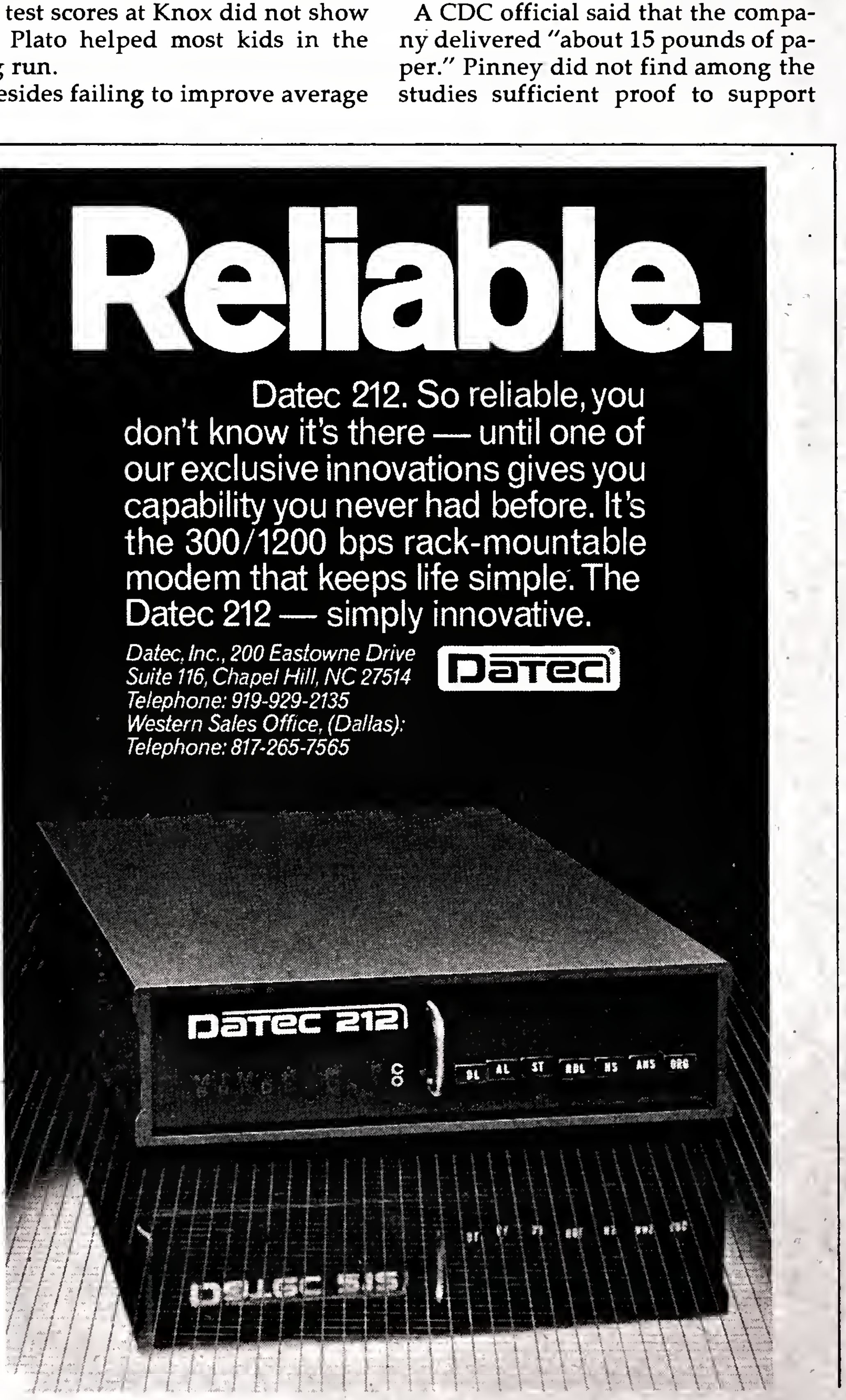


American Bell Faces FCC Audit in Immediate Future

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T's new subsidiary, American Bell, Inc., will be audited by the Federal Communications Commission (FCC) "in the immediate future," the commission has announced. The audit will cover the preoperational expenses and investments by AT&T on behalf of the subsidiary, plus the phone company's "control mechanisms" for complying with the FCC's Second Computer Inquiry decision.

Several AT&T competitors say AT&T plans to share more facilities with American Bell than the Computer II decision permits. Moreover, some Bell rivals allege that the phone company has not charged enough preoperational expense to the subsidiary, thus giving American Bell a hidden subsidy at the expense of regulated ratepayers.

American Bell, formed last June, initially received $3 million in cash and $56 million in property from Bell. This investment is earmarked for Advanced Information Systems/Net 1, a sophisticated data communications network designed to neutralize incompatibilities among present data terminals and provide users of dumb terminals with many intelligent terminal functions.

Early last month, AT&T filed a second capitalization plan involving the transfer of nearly $5 billion in cash and physical assets by 1985. The plan is intended to support American Bell's terminal marketing activities, scheduled to begin next January. Most of the criticism from AT&T competitors has been generated by this latter announcement.

In addition, AT&T critics say the second capitalization plan allows American Bell to acquire physical assets from AT&T at less than true current value. Critics also allege there is no justification for letting American Bell rather than Bell operating companies service currently installed private branch exchanges, key telephone and data terminal systems.

The FCC is looking into these allegations. It has asked AT&T for additional information to supplement the plan filed last month.

Datacomm Briefs

ICA Compiles Profile Of Communications Pro

NEW YORK — The typical telecommunications professional earns $33,400 a year and manages a $10 million budget, according to a survey by the International Communications Association (ICA).

The association's members, 500 of the nation's largest companies, employ 4,000 telecommunications professionals. About 1,400 of them, representing 237 ICA member companies, participated in the survey, which was conducted by Cooper & Lybrands, a management consulting firm.

Although the typical salary is $33,400, some telecommunications professionals earn as much as $55,000 and supervise $90 million budgets. The biggest salaries and budgets are found among investment banking, engineering, research and development and fabricated metals companies, said William T. Rush, who headed the survey group.

Professionals handling voice and data services tend to be paid more than those with voice-only or data-only responsibilities, according to the study. Other major findings:

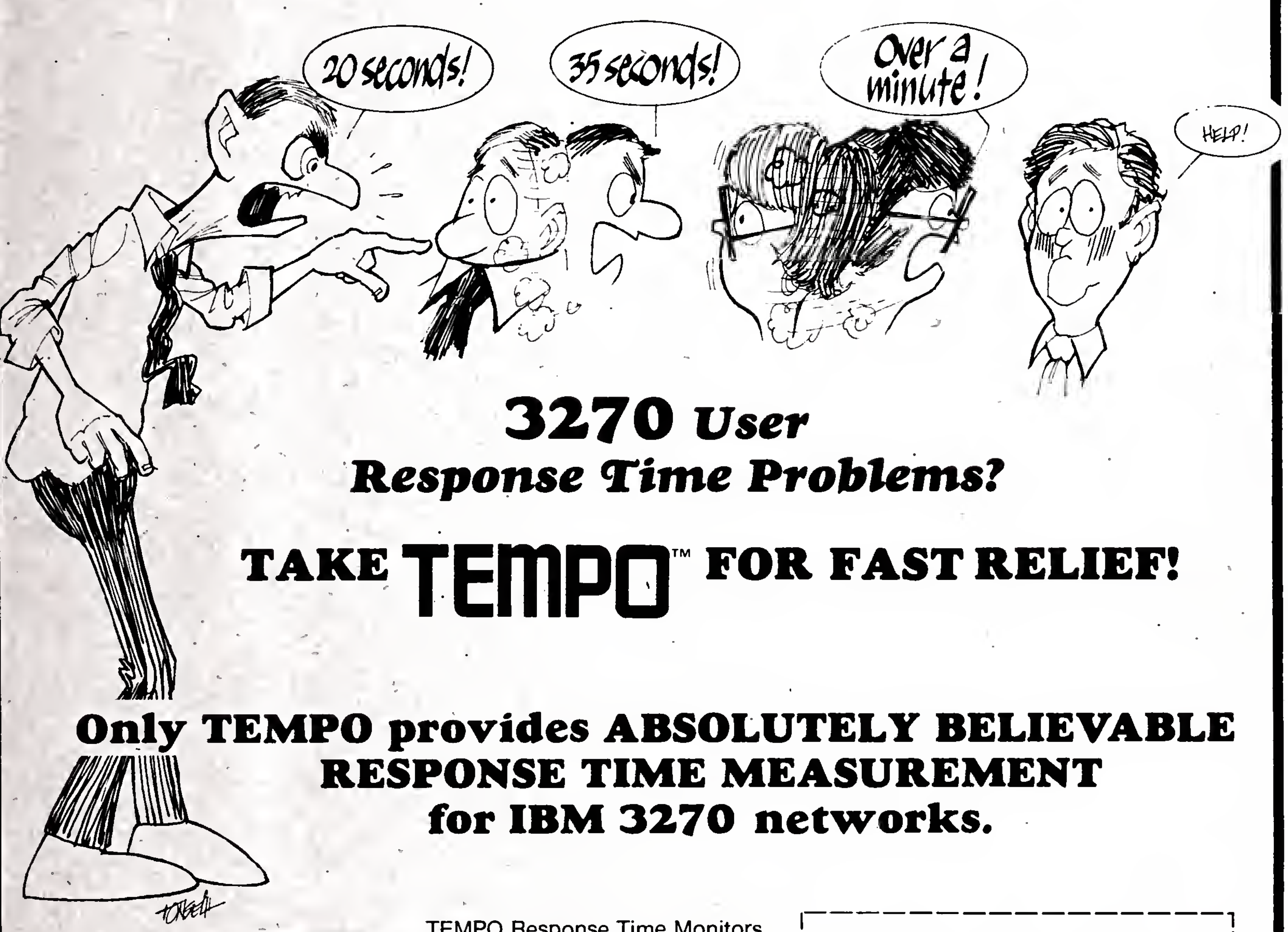
- Most of the respondents had 10 or fewer years' experience in the telecommunications business.
- Seventy-five percent of those surveyed received training on the job and only 3% have taken college courses in telecommunications management. According to Rush, this finding reflects a serious problem — the lack of formal training for individuals who, besides spending a lot of their employers' money, can significantly improve their companies' profits and productivity.

RCA Globcom Asks OK for 10% Rate Hike

WASHINGTON, D.C. — RCA Globcom Systems, Inc. has asked Federal Communications Commission (FCC) approval for a 10% rate increase for its Private Line Access Network (Plan) service, a low-speed (75 to 2,400 bit/sec), point-to-point offering that competes with AT&T's Series 1000 and Western Union's Series 254 services. The Plan network terminates in 31 cities.

The increase, if accepted by the FCC, will become effective this week.

The new Plan mileage charge ranges from 37 cent/mo for 75 bit/sec units to $2.49 for 2,400 bit/sec units. The new circuit termination charge is $46.20 for terminals operating at up to 1,200 bit/sec and $81.40 for the others; the new station connection charge, for customers in a city where Plan service terminates, is $66/mo plus $1.79 for each mile separating the user's site from the local RCA operations center.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'Casual Users' Become Intermediaries

DPer Gives Tips for Turning Users 'Relational'

By **Lois Paul**
CW Staff

SAN FRANCISCO — How easy is it to train end users to employ a relational data base management system (DBMS)?

Some answers to that question were provided at the first international conference held here last week for users of Relational Software, Inc.'s Oracle relational DBMS.

At a session titled "Training Intermediary and End Users on Relational Data Base Management Systems," session leader J. Kirk Brashear, associate information scientist for applied systems analysis at the University of Dayton's Research Institute, described the program being developed there for the U.S. Air Force to train personnel of its Foreign Technology Division (FTD) to use IBM's Structured Query Language (SQL).

This language is contained in the Oracle DBMS to handle a bibliographic retrieval system. The program is intended for nonprogramming technicians or what IBM's E.F. Codd has termed "casual users."

The latter category includes those whose usage of the computer system is irregular, whose primary job function is not to operate that system and who basically have no knowledge of the system, Brashear explained. "They would like to go up to the computer and say, 'Open Sesame' and have it turn on. We train people who start out as casual users and end up as intermediaries," he claimed.

The first stage of the University of Dayton's method is to teach users the mechanical operation of the system (how to type in a command), give them some knowledge of the data itself and train them on the bureaucracies of their own particular environment. The user's first task is to conduct a simple search (such as SELECT FROM), spool their results and sign off.

"Generally what you are fighting at first is people who are scared to death of the terminals," Brashear said. "Then we get into the real guts of SQL," The 1½-day training session covers the following sequence of topics: ORDER BY and WHERE commands; arithmetic functions and null values; Oracle's User Friendly Interface; BUILT INS, GROUP BY, HAVING commands; nesting; joins; view creation; the data dictionary; and INSERT INTO, UPDATE SET WHERE, DELETE WHERE commands.

One of the problems the users face when operating the bibliographic retrieval system is that their customers will not use the keywords they are learning (such as GROUP BY) when making their requests for information.

People generally do not have problems with nesting, but there are a lot of problems with joins, he continued. The University of Dayton program explains join operations by telling the students that if they have information in another table that they cannot get to, they should use a join to get there.

He described the need to "weed out various terminology" and clauses that otherwise "freeze the hearts and minds" of new users. Accordingly, the University of Dayton threw out the Relational Software Oracle user manual and developed a new one tailored to the people taking the course.

The rewritten user manual includes a function section that explains what each command does, a format section that tells them exactly how to type it into the terminal and a definitions section.

"Most queries [used in the classroom environment] are relatively simple, but I know that's not going to be the case with the Oracle DBMS that is coming up at FTD," he explained. The only way to prepare them for this is "a lot of rope drill."

'Electronic Filing Cabinet'

World Bank Managers Get Prototype DBMS

By **Lois Paul**
CW Staff

SAN FRANCISCO — A prototype "electronic filing cabinet" of tools for divisional managers within the World Bank is being developed using Relational Software, Inc.'s Oracle relational data base management system (DBMS).

Guido deBoeck of the bank's Management Systems Division, described the development of the Divisional Management Information System (Divinfo) to attendees at last week's international Oracle user group meeting here.

The Washington, D.C.-based World Bank has 140 member countries; 90 Third World countries are direct clients. It develops projects and lends money to support projects in those countries in areas such as agriculture, education and health care.

About four years ago, the bank was using Information Builders, Inc.'s Focus package via an IBM-based timesharing service to handle data on lending operations within its six geographical regions. However, operational data also resided on other systems.

Upper management at the bank determined that the first need was to define the operating data. It then brought in a consultant who recommended that all operating data be integrated under a central data base management system with an eventual move to distributed processing and distributed data bases.

In 1981, a task force was set up to evaluate approximately 20 DBMS. Oracle was selected because of its compatibility with the bank's total system configuration, deBoeck said. Oracle running on the 32-bit Digital Equipment Corp. VAX-11 processor under VMS appeared to be more cost-effective at that time, he noted.

Upper management wanted software that would help divisional managers better control project information. The next step was to bring these same aids to managers at departmental and regional levels.

The Divinfo prototype therefore was designed to serve as "nothing else than substitutions for a set of paper forms" maintained by managers, according to deBoeck.

Satisfaction Expressed

These forms, developed using Oracle's Interactive Application Generator facility, cover personnel data, bank operations, work programs, budget or expenditures and project implementation. The latter category, for example, includes tools for keeping track of procurements and disbursements of projects the bank supports.

The Divinfo prototype includes 30 Oracle Interactive Application Facility programs, a set of reference files and standard codes, a library of IBM SQL examples (SQL is the query language used by Oracle) and a rewritten Oracle user guide that has been specially tailored for its target managers. Training on the software consists of workshops and videotapes.

DeBoeck expressed satisfaction with Oracle's ease of use and flexibility during the Divinfo project.

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Update of Relational DBMS Supports VM/CMS

By Lois Paul
CW Staff

SAN FRANCISCO — Version 3 of the Oracle relational data base management system (DBMS), which includes support for IBM VM/CMS-based systems, will be shipped next month by Relational Software, Inc. (RSI).

That announcement was made to the approximately 150 users attending the vendor's first international Oracle user group meeting here last week.

Oracle is also supported on Digital Equipment Corp. PDP-11 systems under RSTS, RSX-11M, RSX-11M Plus, IAS, and Bell Laboratories' Unix; and on DEC's 32-bit VAX-11 systems under VMS.

Oracle Version 3 currently is completing beta testing at both DEC and IBM installations, according to RSI President Larry Ellison. Among the primary goals of the new release are higher reliability and performance, he noted.

Version 3 of Oracle is said to provide for a mapping of data in a prejoin format to optimize the joining of data. It allows the user to mix rows from different tables in one disk block, which is called "clustering," Ellison explained.

Enhancements to Oracle Version 3 also include changes to its User Friendly Interface (UFI) to "try to make it live up to its name," such as an on-line Help facility, and enhancements to its Interactive Application Generator.

According to Ellison, RSI's next Oracle goal is portability, which will reflect a market opting either for larger machines of the IBM 3081 variety or for distributed networks of microcomputers. Oracle includes more than 2,000 modules, written in Bell Laboratories's C language; of those, 30 modules are operating system-dependent, Ellison said.

Expressing a belief that "ultimately SQL will become the de facto standard in the relational DBMS business," Ellison stressed that Oracle is upwardly compatible with IBM's Structured Query Language/Data System (SQL/DS) and claimed that Version 3's query is identical to SQL/DS syntax. Oracle is designed to extend the capabilities of SQL/DS with facilities such as its report writer and program generator.

Ellison anticipates that IBM systems will become RSI's major market for Oracle, making the product directly competitive with packages such as Cullinane Database Systems, Inc.'s IDMS.

In addition, Oracle's upward compatibility with SQL/DS will make it possible for Oracle uers to take advantage of future application packages developed for the IBM system, he maintained.

Oracle Version 3 for IBM 3033-type systems running VM/CMS is $96,000. For IBM 4341-type systems running VM/CMS, Oracle Version 3 costs $72,000. The first production versions of Version 3 are targeted for shipment on Sept. 15.

Relational Software is located at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

He's Staying In Touch

CW Photo by L. Paul

Larry Ellison

SAN FRANCISCO — It isn't every day that the president of a software company sits at a terminal and conducts an on-line demonstration of a new product feature for a group of his users.

Larry Ellison, president of Relational Software, Inc. (RSI), took upon himself the task of explaining the changes to Oracle's User Friendly Interface (UFI) at the firm's first international user group meeting here last week.

In his opening address, Ellison noted that when he is asked what he does for a living, he still tends to describe himelf as a professional programmer. RSI is "basically run by technocrats learning to be managers rather than managers learning to be technocrats," he added.

RSI's approximately 35 full-time employees have use of over 100 terminals at the office and in their homes. "I don't know who I am having lunch with if the system is down," he said, noting that all calendars are kept on the system.

Ellison still gets involved in marketing, training, documentation development and technical development projects, and he attends all design sessions. "I think it is very easy to play the chief executive officer and lose track of what is going on," he said.

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WU Asks OK to Build First U.S. Teletex Net

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Western Union Telegraph Co. (WU) has requested permission from the Federal Communications Commission to build a teletex network — the first in the U.S. — connecting 25 cities. There would also be a connection to West Germany.

Commercial service could begin as early as Oct. 15 "and no later than the end of the year," a spokesman for the telegraph company said. When it goes on the air, according to WU, the service will connect Boston, Miami, New Orleans, Houston, Los Angeles, Portland, Ore., Denver, Chicago and Detroit, as well as all the larger cities within the interior of the country.

The service will be available in two basic forms. Option 1, encompassing both domestic and international teletex service, will be priced at $300/mo, plus per-message charges. Option 2, allowing message exchange only within the U.S., will cost $500/mo without any additional message fees.

The proposed tariff also includes nonrecurring service and installation charges.

Western Union's basic goal is to transmit teletex messages between communicating word processors at a cost competitive with domestic and international airmail rates [CW, July 26]. This would mean a cost of about 35 cent/page for domestic teletex service and $1/page for service to Europe.

Users with word processing terminals that conform with international teletex standards will communicate with WU's teletex switching center in New York through conditioned private lines. At the moment, according to the WU spokesman, four companies are marketing such terminals: Siemens Corp.; Olympia, Inc.; Facit, Inc.; and North American Phillips Corp. At least 10 other manufacturers, however, have applied for certification.

The effective transmission rate through the network will be 2,400 bit/sec, which is nearly 50 times faster than telex.

One of the special features of the WU offering will be the ability to deliver teletex messages to telex customers here and abroad and vice versa using speed, code and protocol conversion software built into the New York City teletex switch.

The basic monthly charge — $300 for Option 1 customers and $500 for Option 2 customers — will cover the 2,400 bit/sec access line plus the modem and switch port termination in New York City. Service installation carries a one-time charge of $200 for users of either option.

In addition, Option 1 customers will pay 50 cents for each call placed, plus 84 cent/page transmitted to or from Germany or 35 cent/page transmitted between domestic U.S. teletex stations. This arrangement, according to the WU spokesman, will encourage customers to bunch their calls and thus increase network throughput. It will take about seven seconds to send a page of text through the system, but seven to 10 seconds to set up the call, he explained.

Canada is expected to become the second foreign country connected to the network. Negotiations are now under way with CNCP Communications, that country's major record carrier; an agreement is likely to be announced "around the end of the year," according to the WU spokesman.

Interconnection discussions are under way with Austria, Italy, South Africa and the Scandinavian countries, he added.

Optical Disks Replacing Library of Congress Cards

David Gray Remington, chief of the Library of Congress' Cataloging Distribution Serivce, holds one of the optical disks that will replace traditional library cards. Each disk stores about 200,000 library cards.

WASHINGTON, D.C. — Xerox Corp. has installed at the Library of Congress what it said is the first digital delivery system using optical disk technology. The storage, retrieval and printing system converts library cards written in over 60 alphabets to digital images.

For organizations like the Library of Congress that need to catalog large collections of information, the system may be used to convert text and illustrations contained on paper or film-based documents to digital images for storage and retrieval on computer systems using optical disks.

Designed by Xerox Electro-Optical Systems, the system should reduce dramatically manual card handling and order processing time at the library.

The number of file cabinets containing catalog cards at the library formerly ran the length of a football field. That information can now be stored on approximatley 30 14-in. optical disks.

Another advantage of the digital delivery system is that catalog information on a disk is less likely to be lost or damaged than in a manual card-filing system, a Xerox spokesman said.

Executive Seminar Offered

BOSTON — The problems and inabilities the information processing community has in providing effective support for management and business operations and in developing systems that deal with business from a business viewpoint, will be explored in a five-day executive seminar sponsored here by the Franklin Boston Group.

"The Business Analysis Workshop" will focus on the identification and description of business functions and will detail how to define the context and purpose of an analysis, map out a plan, select the appropriate tools and apply these tools to produce the required results. It reportedly will also cover planning strategies for future products, identifying and localizing problems and incorporating new business functions.

The workshop is geared toward managers who need good analytical skills for developing information systems. The fee is $875. The next two workshops are scheduled for Oct. 18-22 and Nov. 15-19.

Additional infomation can be obtained from the Franklin Boston Group, Suite 321, 120 Tremont St., Boston, Mass. 02108.

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(Please indicate the types of ASCII CRTs you would intend to use with SIM3278)

Travel Reservation System Buoys Cruise Firm

CENTURY CITY, Calif. — A cruiseline firm here is keeping its business afloat with a recently installed computerized reservation system.

Sitmar Cruises installed the system to handle passenger service and reservations. The system, which combines a 3M-byte Data General Corp. MV/8000 supermini with an automatic call distribution system from Rolm Corp., was developed specifically for the cruise firm over the past 18 months, according to Alan Buckelew, Sitmar's vice-president for systems and data services.

Employing approximately 70 terminals and three DG Model 277 disk drives, the system displays cabin availability for each ship and cruise and accepts all the information necessary for making a new booking. In addition, the system automatically prices bookings, including any land excursions, air fares and special discounts, Buckelew said.

Using software designed by Touche Ross & Co., the system gives each reservation a unique booking number at the time the reservation is entered. This, Buckelew explained, allows reservation sales agents immediately to recall information entered, even air flight accommodations and special passenger notes.

This feature allows Sitmar or the passenger's travel agent to accommodate itinerary changes, Buckelew said.

The system also assists Sitmar in administering its Airsea program. Airsea, Buckelew explained, offers passengers who do not live in port cities reduced air fare. The processor automatically recommends the most direct accommodations for the passenger. That information is then given to the Airsea staff, which books the reservation using American Airlines' Sabre system.

Pierside and shipboard check-in, passenger, dining and special service lists are automatically produced by the MV/8000. In addition, the system provides inventory control and market management features that allow Sitmar to monitor passenger service and project cabin utilization, Buckelew said.

Both the Rolm call distributor and the MV/8000 can be used to provide information on individual reservations, such as who the sales agent is, how much revenue has been booked and average call and booking duration. In addition, Buckelew said he expects staff productivity to improve because some menial tasks have now been automated.

Future plans for the system call for adding 10 to 15 terminals and expanding some functions. For example, Buckelew said Sitmar plans to incorporate the system into some shipboard functions including onboard passenger services and accounting.

HCA Hospitals Link Records With Network

NASHVILLE, Tenn. — One hundred and sixty Hospital Corp. of America (HCA) hospitals are now linked by intelligent-terminal-based information processing equipment.

Headquartered here, HCA owns and operates some 200 hospitals and manages another 150 institutions. HCA has worked with General Electric Information Services Co. (Geisco) since 1973, a spokesman said, to use that company's teleprocessing network to keep track of full patient accounting service, corporate financial consolidation, management reporting systems and employee payrolls.

"The HCA hospitals use Geisco's time-sharing service to collect and edit data and pull out reports," a Geisco spokesman said. "The data is collected mostly during the day and processed at night."

The transition by HCA member hospitals to the Geisco's Marklink intelligent terminals began in July 1979. HCA Chairman of the Board Donald MacNaughton was pleased with the outcome of the project. "Working closely with GE Information Services' support personnel, the conversion to the modern equipment was implemented smoothly," MacNaughton said.

"With the Marklink terminals, each of our hospitals is able to keep track of its individual operations, and headquarters can monitor operations collectively," MacNaughton said. "This results in a savings of time and money for both the HCA network and consumers of institutional care."

The terminals offer the convenience and cost savings of a minicomputer and continued access to Geisco's teleprocessing network, an HCA spokesman said. Geisco links HCA hospitals in 26 states from Florida to Oregon, enabling operators to process data locally and to interface with the company's host computer and data bases.

The hospitals owned by HCA used GE dumb terminals before installing the Marklinks, a Geisco spokesman said. At the rate of about three hospitals per quarter, all the hospitals owned by the HCA are scheduled to have the intelligent terminals installed.

The terminal transmission rates are selectable from 300 to 2,400 bit/sec over dial-up lines, a Geisco spokesman said.

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Managers on the Move

PAUL BYERLY has been promoted to director of management information systems (MIS) for Vinnell Corp. headquartered in Fairfax, Va. He will be responsible for information management functions and serve as internal consultant to contract project managers.

Byerly joined Vinnell at its Transportation Center in Baltimore last year to design and install an automated logistics system to support management of foreign military sales programs and freight forwarding. Before joining Vinnell, he served as an U.S. Army MIS Officer and as DP manager for Showcase Corp.

He earned a B.S. degree in electrical engineering from the University of Pittsburgh.

•••

KENARD A. JOHNSTON, GERALD T. LAPORTE and STANLEY R. WRIGHT each have been promoted to the office of second vice-president and operations officer at Manufacturers Bank in Detroit.

Johnston joined Manufacturers in 1975 after a 28-year career at IBM, where he was a national account manager. He was named an operations officer at the bank in 1977.

Wright began his career as a computer performance analyst in 1978 and was named an officer in 1980.

LaPorte started with Manufacturers in 1968 and was named an operations officer in 1977.

•••

RUSSELL A. BRUNDAGE has been named vice-president of data processing for the SAI Group, Inc. in Cherry Hill, N.J. He has responsibility for data processing activities throughout the company's domestic and international operations. Additionally, he will consult with clients in the implementation of insurance mass marketing programs created by SAI.

Prior to joining SAI Group, Brundage held various positions with Colonial Penn Group, Inc., IBM's Data Processing Division and the U.S. Foreign Service. In the latter capacity, he served with U.S. Embassies in the Philippines and Korea from 1950 to 1954. He is a veteran of the U.S. Air Force, where he served with the Strategic Air Command.

Brundage received a B.A. degree from New York University.

•••

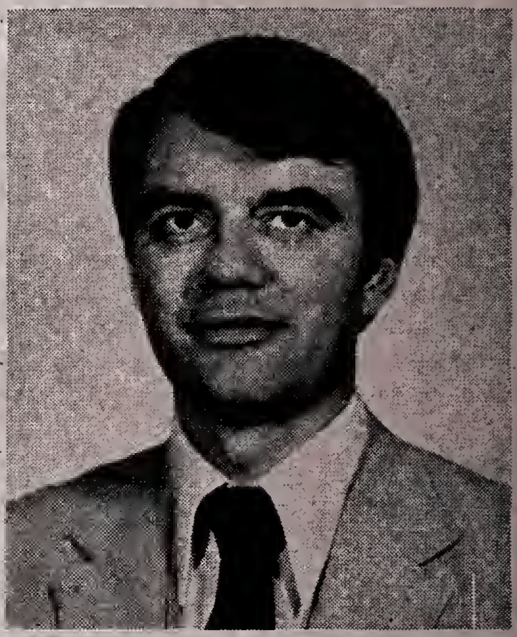
PETER S. BROWNE has been appointed vice-president of consulting services and CHARLES HAGAN has accepted the position of vice-president of MIS for Burns International Security Services, Inc., headquartered in Briarcliff Manor, N.Y. He is responsible for all professional consulting including communications and computer security.

Before joining the company, Browne operated his own consulting practice, Computer Resource Controls, Inc., that subsequently was acquired by Systematics General, where he served as vice-president.

Browne is the author of the 1980 "Afips System Review Manual on Security." He received a B.A. degree from Syracuse University and an MBA degree from the University of Nebraska at Omaha.

Prior to joining the company, Hagan was assistant operations manager of business information systems at Reuters News Service. Before that, he held a number of MIS positions with the *New York Times*, Long Island Lighting Co. and the Nestle Co.

Hagan earned his B.S. degree from Clemson University.



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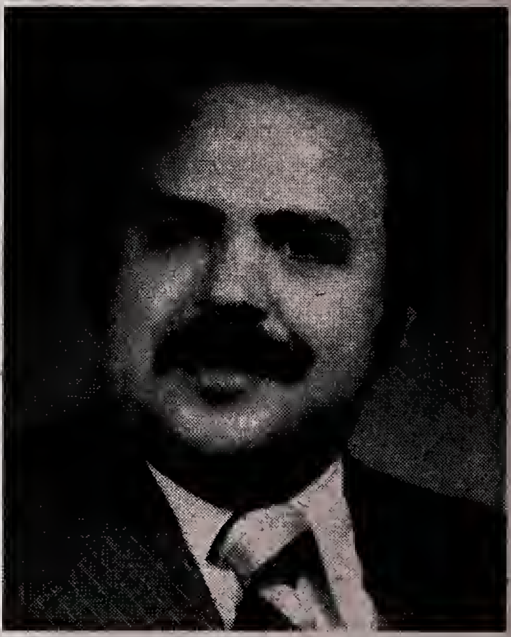

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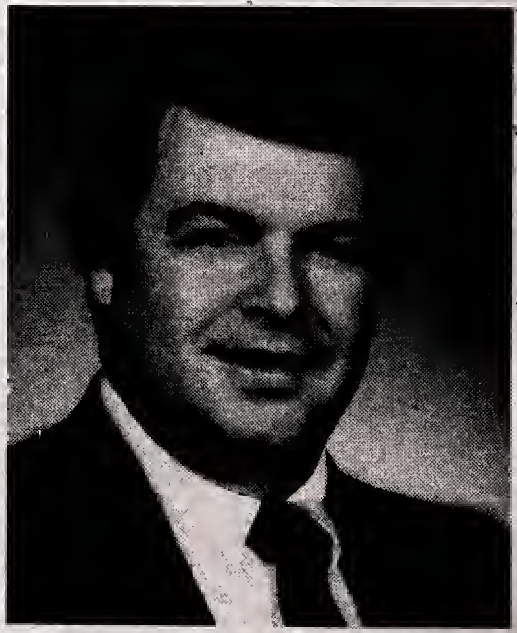

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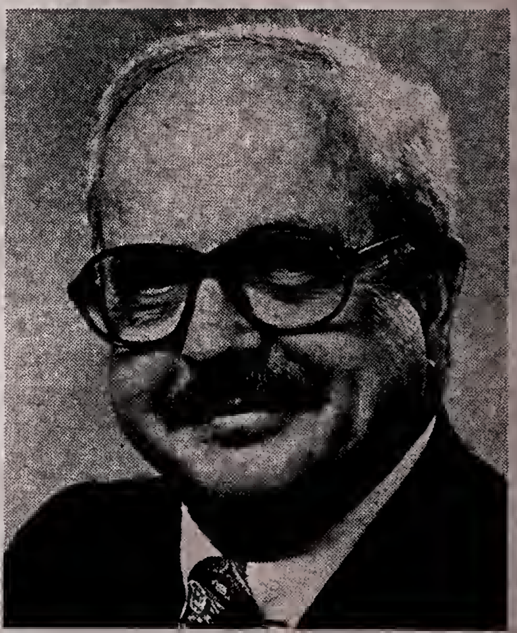

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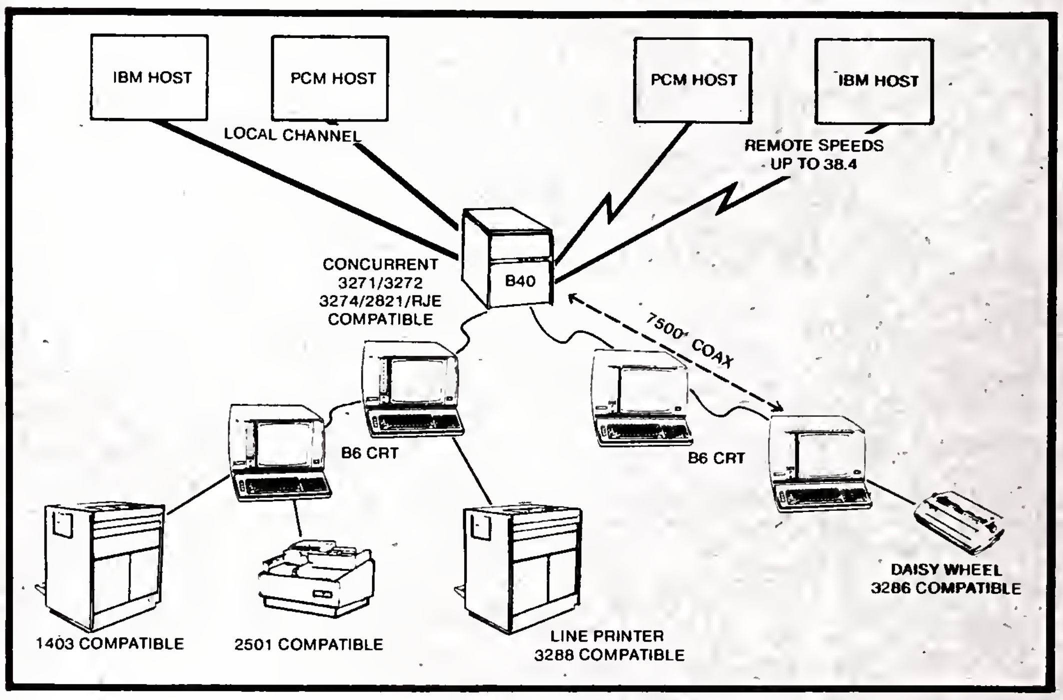

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Federal Office Expo Set for March; Will Address Systems Integration

WASHINGTON, D.C. — "Office Systems Integration: Myth or Reality?" is the theme of the Seventh Annual Federal Office Expo slated to take place here March 14-17, 1983. This event will be sponsored by National Trade Productions, Inc., in conjunction with the U.S. Department of Agriculture's continuing education series.

Two changes have been made to this year's agenda in response to feedback from attendees at the 1982 program. An expanded program will be included, geared to high-technology issues within the government; and a new commercial sector segment has also been added.

A three-day exhibition will be held at the conference, featuring the industry's latest office products.

The registration fee for the expo has not yet been determined, but further details are available from National Trade Productions, Inc. at 9418 Annapolis Road, Lanham, Md. 20706.

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Call for Papers

ASSOCIATION FOR COMPUTER MACHINERY SPECIAL INTEREST GROUP ON DATA COMMUNICATIONS (SIGCOMM) '83, Austin, Texas, March 8-9.

Sigcomm invites papers that focus on state-of-the-art network architectures, algorithms and protocols for data communications. Papers concerned with both theory and practice based on software design for specific applications and/or specific technologies are being solicited.

Papers are due Sept. 1. Papers and inquiries should be directed to Dr. David C. Wood, The Mitre Corp., 1820 Dolly Madison Blvd., McLean Va. 22102.

PHOENIX CONFERENCE ON COMPUTERS AND COMMUNICATIONS '83, Phoenix, Ariz., March 14-16.

The Institute of Electrical and Electronics Engineers (IEEE) in conjunction with the Computer and Communications Societies and the Phoenix IEEE Section is sponsoring this conference. Papers being accepted include topics such as solid-state electronics in computers and communications, computer science, computer-aided processes for design and manufacture, integrated circuits and devices, the human element and software development and delivery and related software issues.

An abstract of 300 words is due Sept. 15. The completed paper is due Oct. 11. Submissions should be sent to Gerald Fetterer, GTE Automatic Electric Lab, 2500 W. Utopia, Phoenix, Ariz. 85027.

EIGHTH INTERNATIONAL JOINT CONFERENCE ON ARTIFICIAL INTELLIGENCE (IJCAI) Karlsruhe, West Germany, Aug. 8-12.

IJCAI '83 invites papers for presentation at the conference. Papers concerning all aspects of artificial intelligence will be considered including automatic programming, cognitive modeling, expert systems, knowledge representation, learning and knowledge acquisition, logic programming, natural language, planning and search, robotics, system support, theorem proving and vision. Long and short papers will be accepted. Long papers should be a maximum length of 5500 words and short papers should be a maximum length of 2250 words.

An abstract of 100-250 words and the completed paper (four copies) are due Feb. 1 and should be sent to Alan Bundy, Department of Artificial Intelligence, University of Edinburgh, Hope Park Sq., Edinburgh EH8 9NW, Scotland.

Course Released For Programmers In IBM RPG-11

WOODLAND HILLS, Calif. — A computer-assisted course for beginning IBM System/34 RPG-II programmers is being offered by Automated Training Systems, Inc.

The course is self-paced audio cassett and diskette aided and provides comprehensive, practical training in the design and coding of programs using the full capabilities of the System/34 RPG-II features, ATS said.

The course covers the RPG cycle, disk file processing, arrays and tables, disk-to-disk programs, data structures, external switches, internal documentation and other topics.

Included are 12 audio cassette tapes, several illustrated study guides and workbooks and a diskette with 55 source programs and the test files needed to execute them that can be accessed and modified by the student. The average time to complete the course is 40 hours.

A two-week free trial is available. The course costs $695 from ATS at 21250 Califa St., Woodland Hills, Calif. 91367.

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Hunger Organization Finds Relief With Mini

PHOENIX — It may not push a cart through the frozen food section, but a minicomputer here is doing some heavy-duty grocery shopping.

The processor is owned by Food for the Hungry, an international organization that provides disaster food relief and organizes food production and distribution development projects for underdeveloped countries.

"Our mission is to provide help to starving people," according to president Dr. Larry Ward. To accomplish that goal, the nonprofit organization must rely on donations. About a year ago, the organization decided to buy a computer system to help process more than 120,000 donor names and files.

"We are supported primarily by individual and corporate donations, and it is also our job to put the maximum percentage of these dollars to work in providing food or related help to feed millions of starving people throughout the world," Ward said.

The organization decided to buy a General Automation, Inc. 16/470 processor with 256K bytes of main memory and five CRT terminals for data entry.

"By installing the system, we reduced our turnaround time on receipt mailing to one day, giving our donors a more immediate response to their contributions. Data entry errors have been virtually eliminated since names and addresses can be verified in real time now," according to William Moy, exeuctive director of the organization.

The General Automation system is part of a turnkey system developed by Donor Automation Co., a San Bernadino, Calif., firm that specializes in applications for nonprofit organizations.

Before Installation

Before installing the system, Food for the Hungry used a service bureau to account for contributions and process mailing lists. "Turnaround time to mail receipts for donations was averaging 10 days, excluding data entry errors, which required exceptional handling and were often as high as 10% of each day's input. While our regular monthly mailings were handled effectively, special mailings were expensive and sometimes impossible to perform in time when emergencies arose," Moy said.

In addition to helping solve those problems, the in-house system has also improved the Food for the Hungry's ability to track donors and produce more segmented mailing lists. "Now that we control our own computer resource, our special mailings are simplified," Moy said.

The system uses a coding system for each donor. The codes indicate different factors, such as what approach attracted that donation. "Instead of mailing 100,000 appeal letters on a broadcast basis, at 20 cents each, it is possible to select a mail audience of folks most interested in a particular project," Moy said.

As donations are received, common-dollar donations as well as new donors are sorted for data entry. About 800 entries per hour can be processed. Those donations are then deposited in the bank the same day, Moy said. Names and addresses of donors are verified on-line.

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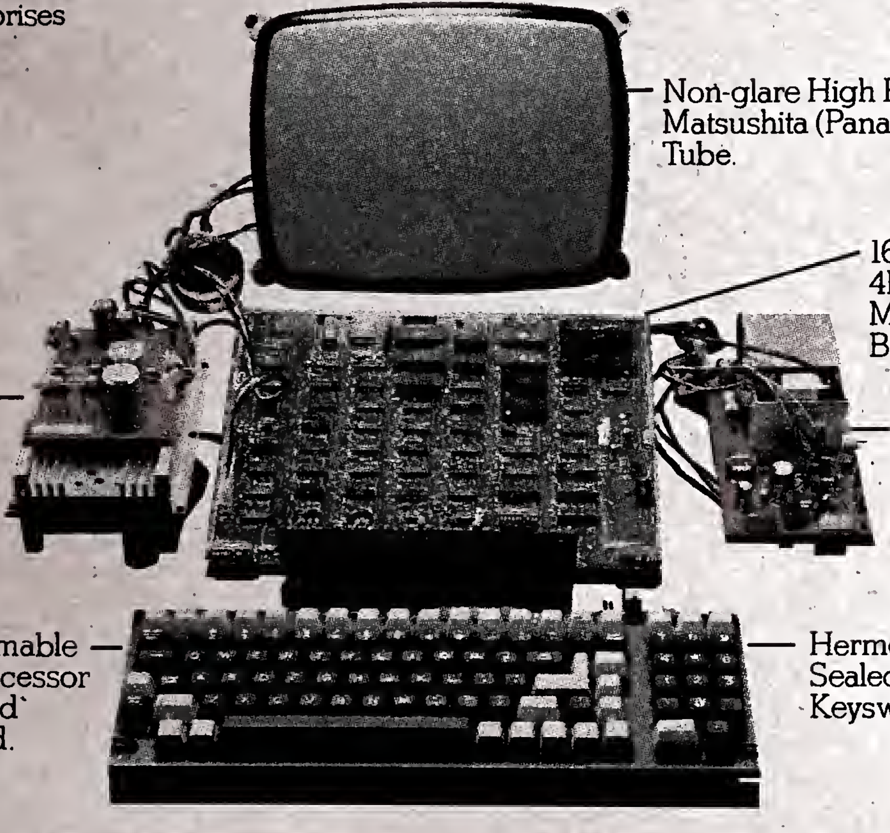
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Insurer Fights Inflation With Software Switch

COLUMBUS, Ohio — The challenges posed by high interest rates, inflation and government regulations led a life insurance company here to seek more efficient systems software to improve its operations.

Jefferson National Life Insurance Co. reached the $3 billion mark last year. According to its president and chairman of the board, E. Kirk McKinney Jr., Jefferson National has faced a multitude of recent operational challenges that confront all those involved in the life insurance industry.

"Inflation has challenged us to find a way to live within the limited expenses margins of old premium rates. High interest rates have challenged us to find a way to meet the stiff competition from banks and other financial institutions. In addition, we are being constantly besieged by the increasing pressures of multistate and federal regulations and heavy taxation," McKinney said.

One of the methods used by Jefferson National to meet these challenges successfully has been the implementation of new systems software.

Jack G. Levy, manager of training and systems software for Jefferson National, said that when he joined Jefferson National as a programmer nine years ago, the company was using IBM software exclusively.

Since then, Levy has brought in a number of products from Goal Systems International. The first was Goal's Fast Linkage Editor (Flee) to replace the IBM software the firm was using as a linkage editor for its teleprocessing system. Levy said that whereas the IBM software took 44 minutes to complete the linkage editor process, Goal Systems' product completed the identical process in nine minutes.

"The savings alone were dramatic. But Flee also gave us the flexibility to run in any partition, at any time, in any library," Levy said.

Today the number of linkage edits Jefferson National programmers run on a weekly basis is close to 200. "The time savings factor is totally tremendous," Levy said, noting he has since taken advantage of most Goal Systems' products applicable to Jefferson National's operations.

Jefferson National also uses Goal's Fast Linkage Editor/Fast Library Maintenance/Fast Library Copy (Flee/Flim/Flic) and Fast Queuing System/Fast Transient Loader (Faqs/FTL). In addition, Levy is currently using Goal's performance evaluator tool, Explore/Discover, to gather information to evaluate where any bottlenecks to top efficiency exist.

As an example of the service provided by Goal, Levy cited a problem Jefferson National had interfacing its on-line source code maintenance facility, Westinghouse Electric Corp.'s Westinghouse Scepter system, with Goal Systems' NQ DQ facility. Scepter was designed to run in an environment where IBM's library utilities were also being used to access source statement libraries. In order to guard against Scepter and the IBM library utility (Maint) gaining concurrent update access to a source statement library, Scepter was designed to permit the catalog of source elements only if it determined that IBM's Maint was not running.

Potential Problem

Since Goal products permitted Jefferson National to use library utilities (including Maint) in any partition at any time, concurrent update access to a library by the two software products became a potential problem.

This was not acceptable to Jefferson National, so Levy set up a three-way conference call with technical personnel at Goal Systems and Westinghouse. The parties resolved the problem by providing a keyword in the Scepter generation macro, which invoked a call to Goal Systems' NQ DQ module. "This fully protected all catalogs, renames and so forth across all partitions including our on-line system," Levy said. "It is this kind of support that makes a vendor such as Goal Systems stand out. Many others would simply respond that their system did not support a certain facility or take the position that the information was not available to customers."

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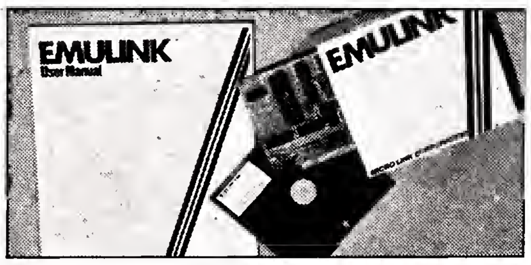

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Reliability Most Important

School District Awards Package High Marks

SAN DIEGO — When your data center serves the second largest school district in California — 200 schools, 120,000 students and 24,000 employees on the payroll — there's no time for machine failure.

Such is the case with the data center for the San Diego Unified School District.

"We process several large on-line systems which run between 5:30 a.m. and 6:00 p.m., Monday through Friday," explained John Crane, director of data systems for the school district. "Our batch work is processed at night and must fit into a very small time window.

"Needless to say, reliability is most important to our data center. We just don't have time for hardware failure."

The school district's data center supports over 100 terminals with an IBM 3031 and peripheral equipment from various vendors. In addition to on-line administrative systems such as personnel, purchasing and material control, other large interactive systems handle the daily functioning of the school system.

Important System

"The transportation system is one of the most important on-line systems," Crane said. "The district operates over 600 buses, approximately one half of which are district buses and one half contract carriers. The system maintains all of the routes these buses run and directly supports the dispatchers."

There is also a driver check-in system that gives bus drivers all the information they need each day. A film booking system provides on-line reservation and tracking for the school system's entire film library and allows teachers to reserve films up to a year in advance.

Where did the system's reliability come from? According to Crane, largely from University Computing Co.'s (UCC) Reliability Plus (R+) software package.

"Before we had UCC R+, we had no way of showing vendors exactly where and when our hardware problems occurred," Crane explained. "Now that we have the package, the data center management gets daily reports which tell us which devices failed and why. In addition, the UCC R+ monthly Database report ranks all the data centers using the same devices, so we know exactly where we stand among the 600 or so other UCC R+ users."

Performance Improvement

While the data center's ranking among the UCC R+ user population has not changed considerably since the system was installed in November 1980, there has been a significant improvement in hardware performance.

Crane pointed out that the UCC R+ reports help customer engineers (CE) be more responsive. One CE actually calls in the report to his manager each day.

"Our vendors are more concerned about the performance of our equipment and more conscientious in their maintenance procedures," Crane said. "There's also more friendly cooperation between vendors and our data systems people — something that hasn't always been the case."

UCC R+ has helped the San Diego Unified School District's data center in areas other than vendor relations, too, such as helping data center management make hardware purchasing decisions.

In the fall of 1980, the center leased some disk drives and planned to keep them for two years before determining whether to continue with that particular product line.

"As a result of seeing the lack of failures in that equipment through the UCC R+ reports, we decided not only to stay with that line but also to purchase even more of those drives," Crane noted. "We didn't have to wait two years to make that determination. It took less than six months."

Feel for Reliability

Another benefit the data center management receives from the monthly reports is a feel for hardware reliability throughout the U.S. They can tell how reliable the district's equipment is as compared to the same equipment monitored by UCC R+ in other data centers, he said.

The product also provides the data center staff with the ability to identify the bad tapes, disks or hardware and to do something about them, thus improving the center's image to its users. Before, there was really no way to be aware of the problems.

Does Crane feel that the expenditure for UCC R+ has been justified? "Absolutely!" he said. "Since we installed UCC R+, my managers have become more knowledgeable about hardware failure and how to eliminate it.

"Personally, I know less about failure problems because I don't hear about them anymore. And I'd rather spend money on UCC R+ than trying to cure ulcers," he concluded.

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Should DP Functions Be Separated?

Turnaround Time

By Larry E. Long

Q **I work for a small state government agency (150 people). We are in the process of splitting data processing maintenance and development into two separate functions.**

As programmers and analysts, we are upset because we do not know who is going to be transferred, and we view it as a step in the wrong direction as far as a career move.

Do you see this as the correct way to set up a data processing department? If transferred to the maintenance section, how can we make the best of it?

A The development of an information system is ongoing. Maintenance is simply a post-implementation extension of development. For this reason, development and maintenance should be integrated. If one follows this line of reasoning, the proposed organizational changes are indeed a step backward.

Perhaps it is unjustified, but nevertheless there is a stigma associated with maintenance. From a career development standpoint, professionals should be given the opportunity to participate in both development and maintenance projects.

How to make the best of it? Keep a positive attitude and be the best programmers and analysts that you can be. Conduct periodic system reviews and anticipate user requests. This responsiveness and enthusiasm will not be overlooked when it comes to promotions and managers respecting your suggestions.

Q **We don't have a single system with up-to-date documentation. Good documentation was a top priority where I was formerly employed, but is all but neglected at my current employer. My team devotes much of its time to trying to learn what was done in the past and what changes have been made.**

Documentation does not seem to be an issue with DP or user managers. How can I and several others who are concerned convince management that we are digging our own graves?

A I've said it before, but I'll gladly say it again: *Documentation is part of the system development and maintenance process.* It's not something you do hurriedly at the end of the project. When done properly, documentation is an excellent development tool and, over the long term, a sound financial investment.

I would expect that your managers have adopted a short-term outlook forsaking system quality and ease of maintenance for an expedient implementation. You might suggest that a staff meeting be devoted to discussing the merits of documentation and what should be done about it.

Q **I wish to comment on the recent letter requesting information on smoker productivity. Although attacking this problem from the productivity angle has its merits, I feel this is not as important as considering the unhealthy environment in which nonsmokers are forced to work whenever a smoker lights up.**

There can be no compromise when it comes to smoking in the presence of nonsmokers. Smokers should not be allowed to smoke in the data center or in any other office environment. It's just as simple as that.

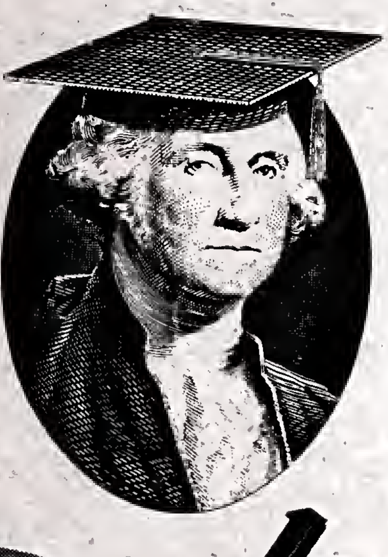
A The day your letter arrived, the president of a local company employing more than 800 people announced that smoking would be banned on company property. The announcement was made to the cheers of nonsmokers and, surprisingly, without rebuttal from smokers. Maybe it is just as "simple as that."

Q **I attend a junior college and will graduate at the end of the next term in data processing. My adviser recommended that I take a noncredit course in typing, saying that it would be of benefit to me in a DP career.**

Several of us are thinking about doing it, but we would appreciate a second opinion.

A The keystroke is still the basic vehicle by which we enter and edit programs, data and text. People in virtually every DP career field routinely rely on the keyboard for computer-based interaction. Therefore, I would recommend that just about anyone pursuing a white-collar career learn how to type.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



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9:00-10:30 AM or 1:15-2:45 PM Introduction. The concept of a Non-Procedural language. General and specific discussion of FOCUS's data analysis facilities-queries, reporting, graphics, formal statistics, financial models and interactive procedures.

10:30-10:45 AM or 2:45-3:00 PM Break for Refreshments

10:45-12:00 or 3:00-4:15 PM FOCUS Master Dictionary, Data Security, Shared-relational files, the Universal File JOIN, Transaction Processing, Case Logic and 3270 screen applications. Recap and Conclusions.

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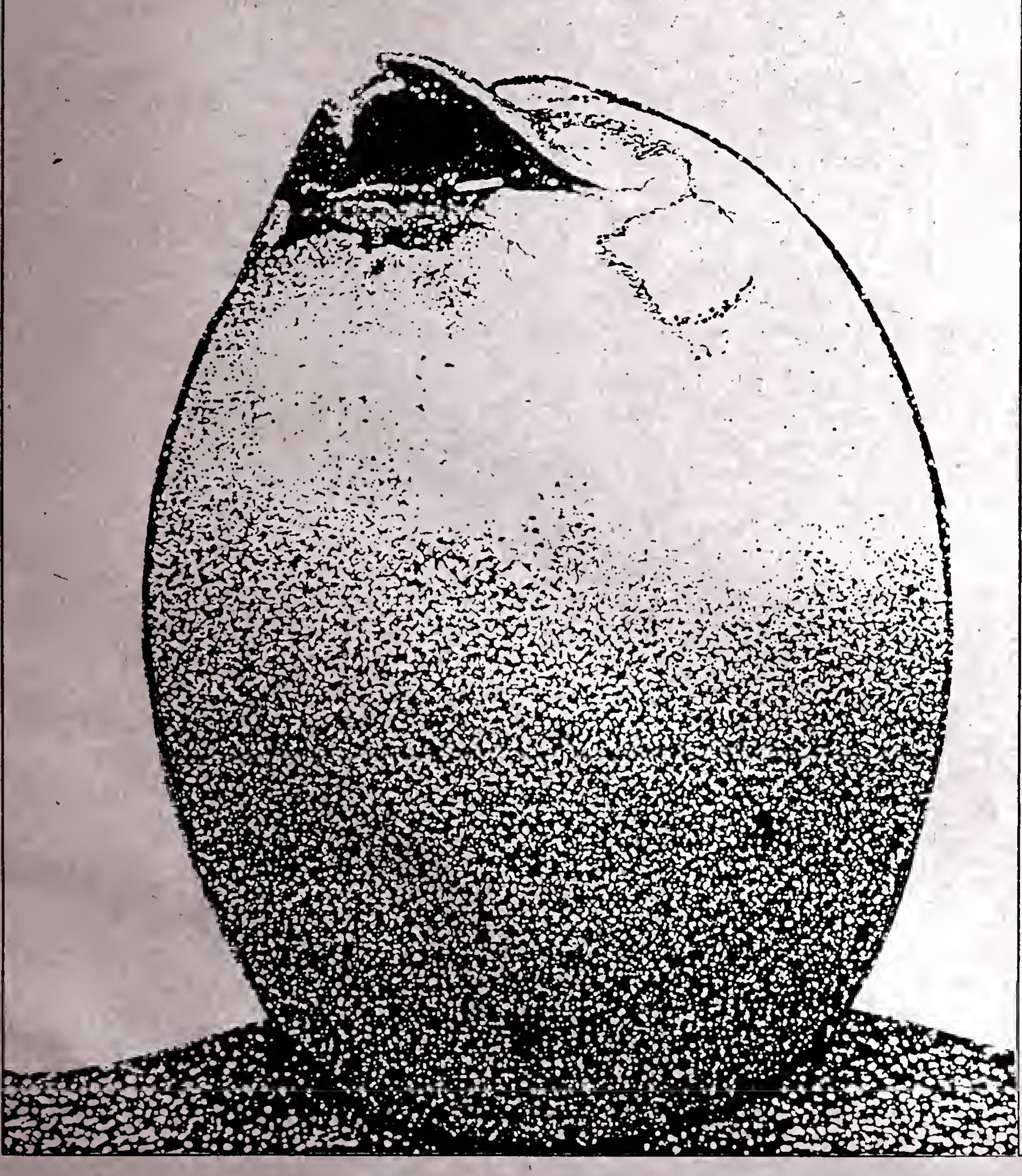
THE BIRTH OF AIS/ NET 1

The Strategy Behind American Bell's First Product

By Walter Levy



On June 15, AT&T announced the formation of American Bell, Inc., its fully owned subsidiary. American Bell, in turn, announced its entry into the data communications service field with Advanced Information Systems/Net 1 (AIS/Net 1) Service, formerly known as the Advanced Communications Service (ACS).

These actions may well mark a turning point in the history of the computer industry. American Bell believes that a large untapped market exists for intercompany data communications services and has committed itself heavily to becoming the leading provider of this new kind of service.

If American Bell is correct in its view, the future structure of computer networks will be changed. So, too, will be the competitive balance between computer equipment and data communications network suppliers.

Users and other network providers alike must give serious consideration to the concepts of intercompany data communications on which American Bell has based its business plan to see if AIS/Net 1 is truly an idea whose time has come.

Most data communications networks have been built initially as dedicated extensions of a user's host processor to service a single application. Different applications would be served by separate networks.

By the late '60s, enough dedicated single-application networks had been installed so that the need for data system interconnection began to assert itself. DP managers recognized that computer systems developed and managed by one organization had to exchange information with others (data system interconnection) and that terminals installed for one system needed to be granted access to another (terminal pooling).

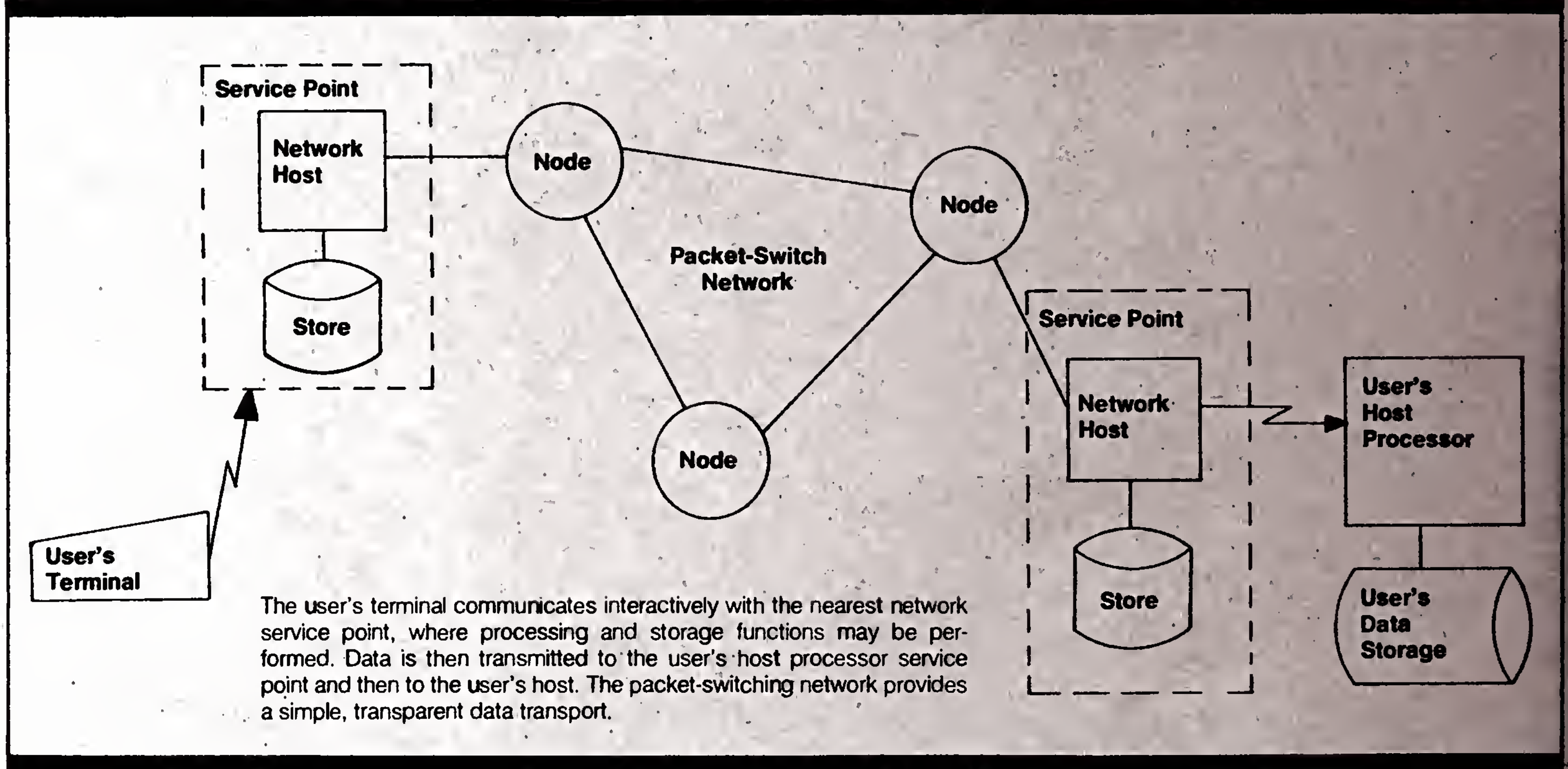
The first organized attempt to solve the problems of data system interconnection and terminal pooling was the U.S. Defense Department's Advanced Research Projects Agency Network (Arpanet), progenitor of GTE Telenet and many other packet-switching networks. These public data networks, which emerged during the '70s, perform a valuable set of functions and are widely used today. Terminal pooling is commonplace and data system interconnection, while less common, is supported.

The public data networks now in wide use provide an essentially transparent link between the user's terminal and host computer. Processing and translation functions required by an application must be performed by the user's host. American Bell expects to carry the role of the public data networks a step further, providing processing power in AIS/Net 1. It is this additional power that

Figures 1 and 2 illustrate the basic architectural differences between AIS/Net 1 and conventional data networks. Conventional networks are essentially transparent to the user. Functions required for data entry, conversion, reformatting and storage must be provided by the user's host computer.

AIS/Net 1 interposes an additional level of processing between the user's terminal and computer and the network: the service point. The user typically would transmit data to his host by first entering the data interactively at the service point closest to his terminal. Depending on the user's requirements, the data, once entered, would be transmitted immediately, or some time later, to the host via another service point.

The additional level of processing power in Net 1 would enable users to perform many functions without involving the host processor.



The user's terminal communicates interactively with the nearest network service point, where processing and storage functions may be performed. Data is then transmitted to the user's host processor service point and then to the user's host. The packet-switching network provides a simple, transparent data transport.

Figure 2. American Bell's AIS/Net 1 Data Network

will enable users to solve all the problems of intersystem interconnection in the *network* rather than in the host and open the door for a new generation of computer communications.

AIS/Net 1 is a dual-mode intelligent network service. It overlays an on-line application-oriented processing service on a foundation of an otherwise transparent packet-switching service.

Users are encouraged to write application programs for the network that will solve the problems of protocol and application language conversion, storage and scheduled delivery independent of the user's host processors. It is these user-written programs residing in the network that give AIS/Net 1 its special character and ability to solve the problems of intersystem communications and terminal pooling.

But AIS/Net 1 does not do the job unaided. The users still have to develop the programs and agree on common language standards. If user communities accept the concepts of AIS/Net 1 and implement common-language systems, then American Bell will become a major provider of network services and the face of computing will change.

If standardization at the application-language level is slow in coming, the full potential of AIS/Net 1 may not be realized.

American Bell has made a strong commitment to its application-oriented technical approach, but AIS/Net 1 is not "the only wheel in town." The older, established data network companies, such as GTE Telnet Communications Corp. and Tymnet, Inc., and the larger time-sharing companies, such as General Electric Co. and Computer Sciences Corp., all have substantial data networks in place that can deliver large amounts of processing power to their users.

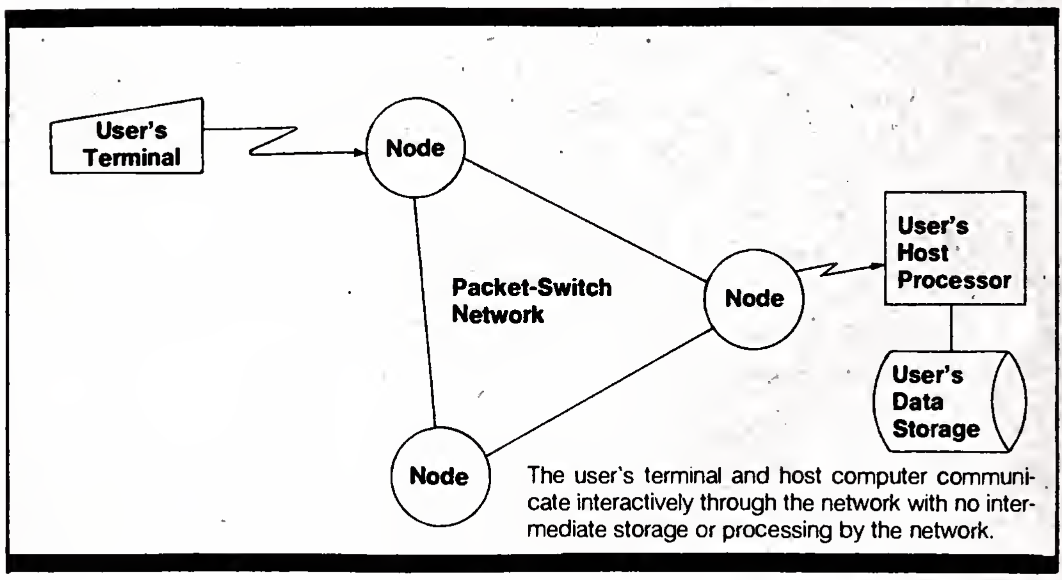
These older systems are capable of expanding their roles to provide the capacity for user-written network applications should the demand materialize. If AIS/Net 1 fulfills its promise, the older network providers will be able to provide comparable services, and a healthy competitive market for application-oriented data network services should emerge.

Competitive Arena

Data networks are increasingly recognized as a competitive arena within which computer equipment and network suppliers fight for account control. Historically, the computer equipment suppliers have offered product-line-oriented networking systems like IBM's Systems Network Architecture/Synchronous Data Link Control and Digital Equipment Corp.'s Decnet. This tends to keep the user committed to host-controller networks using a single manufacturer's products.

The data network suppliers, on the other hand, have offered host- and product-independent network services that help the user "mix and match" equipment and control costs.

American Bell now enters this bat-



The user's terminal and host computer communicate interactively through the network with no intermediate storage or processing by the network.

Figure 1. Conventional Packet-Switching Network

Features	Conventional Networks (Figure 1)	AIS/Net 1 (Figure 2)
Editing	Performed by user host • Long-distance connection via network • Single program in host	Performed at service point nearest to terminal • Short-distance connection to terminal • Multiple program copies for many service points
Data Bases	Single copy at user host • Updates • Potential bottlenecks due to single host	Potential multiple copies at the service points • Read-only at service points • Multiple copies minimize bottlenecks
User Host Commitment	Must be on-line whenever users want service	May be off-line without blocking user services available from network
Application Processing Language	Whatever is available from user host	AIS/Net 1 application language

Figure 3. Architectural Comparison

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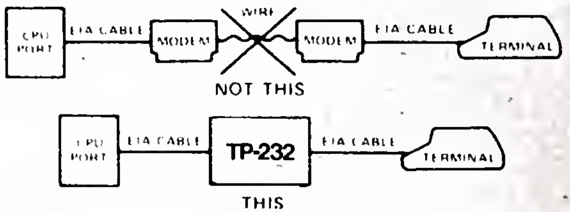

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tleground as a powerful new ally of the other network suppliers, helping the user community avoid single-supplier control of their networks. Regardless of how well American Bell does in the competitive data network market, users stand to benefit from this major entry.

Intersystem Communications

Why is intersystem communications a new market?

Historically, most data communications networks began as dedicated vehicles for supporting individual applications. A user organization would typically start with a plan for a specific application, say, order processing, and select a host processor, identify the locations of its terminals and develop the network along with the application. Software residing in the same host as the application would implement functions for network control, such as:

- Terminal pooling and error detection.
- Traffic supervision and alternate routing.
- Network fault detection, isolation and repair.

Frequently these functions are so closely intermingled with the application programs as to make them indistinguishable. Many such systems have been built, one at a time, to solve specific problems. Integration among systems has been the exception rather than the rule, even in companies with large centralized data centers where several on-line applications might be supported from the same host computer.

The practice of building dedicated data communications networks one at a time continues unabated today because it is simple and direct. But many users have also recognized the need for a change. Large organizations find themselves increasingly overburdened with a proliferation of computers that cannot talk to each other; with duplicate data communications networks, redundant terminals and circuits traversing the same locations; and with expensive one-to-one intersystem data exchange problems.

Corporate acquisitions compound the problem. One company acquires another and discovers it now owns a totally new, duplicative and non-compatible set of terminals and communications facilities.

A company encourages individual divisions to develop their own product sales and order processing systems. When the company later decides to establish multiproduct warehouses and sales offices, it discovers that the various product divisions' computer systems are incompatible and that it must provide a separate terminal for each division in each sales office.

Large companies are increasingly turning their attention to solving the problems caused by multiple systems proliferation.

Large amounts of data are exchanged between many companies, large and small, in certain industries: insurance, travel, manufacturing and freight are the best examples. These user communities are increasingly recognizing that traditional manual or voice communications have become a costly impediment to efficient business operation.

Many such industry groups have grown seriously interested in establishing cooperatively owned data communications networks through which individual companies can quickly exchange data.

Technical Problems

How can intersystem communications be provided?

Implementation of intersystem data communications is very difficult, particularly because it must be accomplished after-the-fact of proliferation of thousands of stand-alone systems. Whatever the vehicle, certain key technical problems must be solved:

- *Lack of application language standards.* If two computer systems are to exchange data about a particular application, such as order processing, then they must use the same terms (parts numbers, quantities, shipping instructions) and same transaction types (inquiries, orders, back orders and so on) and formats. To accomplish this as part of a coordinated design is straightforward; after-the-fact, with independently designed

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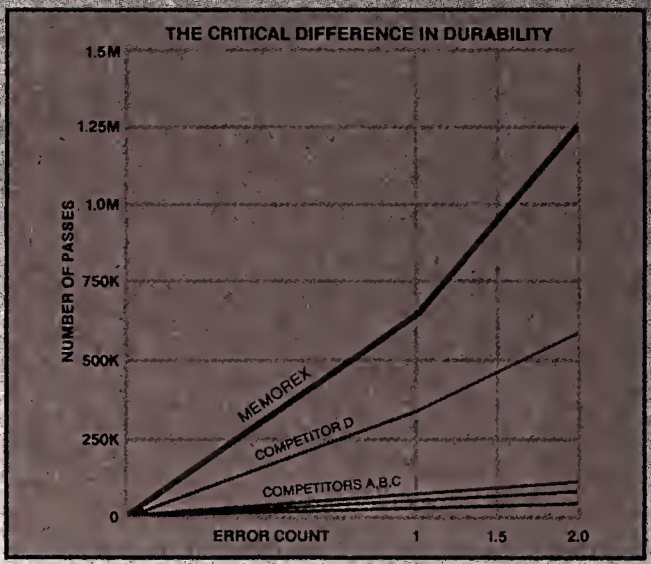

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systems, it is difficult to impossible, depending on how many systems have to be adapted to a set of common standards.

• *Host-controlled networks.* A single dedicated network of terminals can be controlled from the same host computer that contains its application. But if two or more host computers are to communicate with each other or with some portion of a population of terminals available to either, then the network supporting this community of hosts and terminals must have a life of its own and not be subjected to the control of any connected device. Otherwise, problems arising in one host might affect the operation of another.

Most older data networks are host-controlled as are the new network offerings of the computer equipment suppliers. Intersystem data communications is severely limited unless the network is independent of any of its connected hosts.

• *In-house-oriented systems.* Many data communications systems are developed for a limited in-house application. While the user may be willing to network this application with others, the installed hardware and software facilities may not be adequate for the more demanding interconnection environment.

For example, a data entry system might have been designed initially to support a clerical group in the same location as the data center, where it was alright to accept data entry without on-line editing and batch-edit the work for overnight corrections. Such a system cannot be easily extended for remote data entry without being rewritten to provide immediate on-line editing.

• *Interface mismatch.* The interface between a host computer and its terminal population is a combination of communications protocol features, terminal operating characteristics and host-resident application functions.

In a single-application dedicated network, these interface characteristics naturally match. But when an effort is made to permit the dedicated host computer to be accessed by other "foreign" terminals, or to use the dedicated group of terminals to access some other "foreign" host, a potential mismatch arises that must be resolved before intersystem communications can occur.

Systems to Date

How have intersystem communications been handled to date? The problems of intersystem communications have been well understood for many years. Systems have, in fact, been developed to solve these problems for specific user groups under specific conditions.

Bankwire is a good example. Bankwire is a message-switching system operated by a banking-industry-owned cooperative that is used by banks to exchange funds-transfer messages. All Bankwire users agree to prepare messages in a systemwide standard format and to interface Bankwire using one of several standard protocols.

No user bank's host is allowed to control network operation and the interface guarantees against a user's computer malfunctioning and adversely affecting network operation. Banks that do not have sufficiently sophisticated systems to warrant an on-line interconnection to Bankwire may use a Bankwire terminal and manually prepare their messages.

All of the problems of intersystem connection are solved in a specific manner by Bankwire. Bankwire has never had to encounter the major problems of user application language standardization facing other industry groups as banks have always intercommunicated telegraphically using industry-standard message formats.

The public data networks represent a much more general and important example of an effort to solve the problems of intersystem communications. Public data network service, based on packet switching, began in the late '60s with Arpanet, which spawned Telenet, the first commercially oriented network service.

Many public data networks now exist and are widely used as a public vehicle for interconnecting users to computers. Their technology is increasingly being applied to the internal data network environment of

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large end users and government institutions. Packet switching has become commonplace in data networks.

The public data networks in their present form provide an important foundation for intersystem data communications. These networks operate independently of the user host processors. They provide a range of popular types of interfaces for user terminals and computers. They support simultaneous communications between thousands of terminals and dozens of host computers.

A worldwide system of these networks is evolving, with procedural and interconnection compatibility being achieved under the heading of the X.25 standard. A community of user hosts and terminals can, in principle, interconnect with each other through these networks. Many user groups have made use of these networks for interconnection.

The principal limit of the current networks is that they are transparent to the user's data stream and do not have the processing and storage power offered by AIS/Net 1, which is essential for solving the problems of application language standardization and protocol conversion. Thus a user community seeking to establish an intersystem connection through a current-state public data network must solve many of the problems of standardization and compatibility outside of the public network.

It can be done, but the users or a third party must provide the equipment and software and take operating responsibility.

American Bell Approach

American Bell intends to deploy a network composed of processing centers, or "service points," to be located in major cities. Each of these service points will be a major data center consisting of five DEC VAX-11/780 systems front-ended by a group of IBM Series/1 computers and network control facilities furnished by Western Electric. The service points will be linked by a packet-switching network furnished by the Bell System.

Net 1 service will be available at 17 service points in the U.S. by the end of 1983: New York; Chicago; Los Angeles; San Francisco; Washington, D.C.; Atlanta; Philadelphia; Boston; Pittsburgh; Greensboro, N.C.; Houston; Denver; St. Louis; Cleveland; Seattle; Detroit; and Dallas. American Bell projects growth in service point population to 100 locations by the end of 1984.

Each service point is a major processing center capable of supporting user development of on-line applications and executing user-stored programs. Users will be encouraged by American Bell to plan and develop network applications and leave their programs in the network for execution on demand of the traffic.

Because of the large amounts of processing power available at these service points, users will be able to develop relatively sophisticated programs for protocol conversion and application-language standardization and keep those programs online in the network.

A range of technical facilities have been developed by American Bell to support its concept of operations. Some of these facilities will be directly usable by end users while others may be regarded as tools for application development.

The equipment to be deployed by Net 1 is considerably more powerful and costly than the equipment now deployed by the existing providers of data network services. This massive investment represents a significant "up-front" commitment by American Bell to its marketing approach.

Marketing Thrust

In addition to making this major investment in facilities, American Bell has committed itself to a marketing thrust, concentrating heavily on the market for intersystem data communications that it believes will emerge:

- Heavy "preannouncement" market-development activity and communications with trade associations, user groups and multidivisional companies.
- Strong support for industry association efforts to develop common application languages and secure in-

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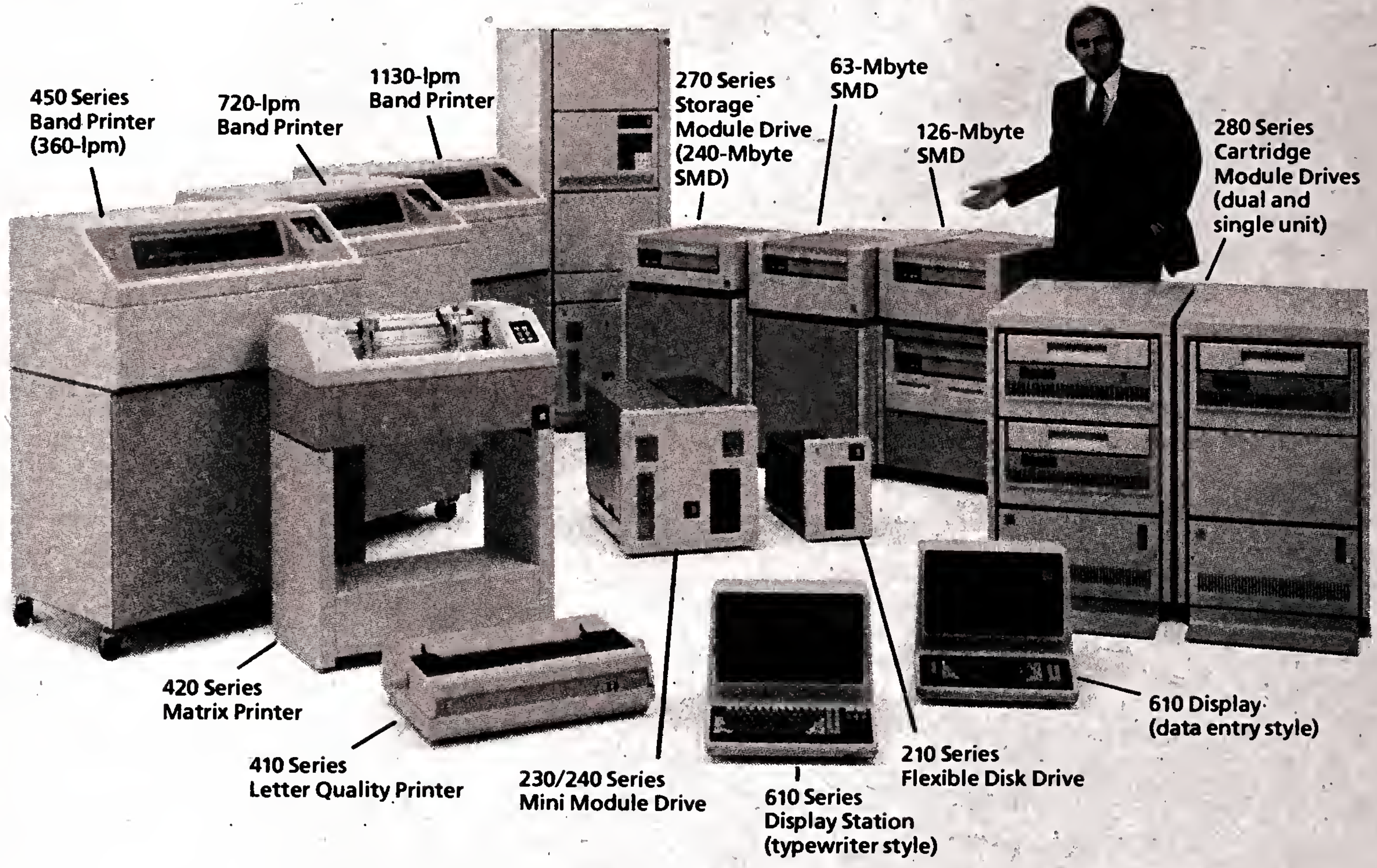

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American Bell has made a big bet on its Net 1 system's acceptance.

On the other hand, it is too soon to tell if American Bell will succeed with its objectives. The success of Net 1 depends heavily on reasonably fast user acceptance of industry-oriented common application languages. Progress in standardization efforts tends to move in decades rather than years and only time will tell whether the special emphasis given this movement by American Bell will prove effective.

> *'The success of Net 1 depends heavily on reasonably fast user acceptance of industry-oriented common application languages. Progress in standardization efforts tends to move in decades rather than years, and only time will tell whether the special emphasis given this movement by American Bell will prove effective.'*

Other Approaches

The established data network and time-sharing companies all use transparent application-independent data networks to link terminals and host computers. These companies also provide intelligent network services from their own host computers, some examples of which are described below:

GTE Telenet offers Telemail, an intelligent network electronic mail service. In this system, a user signs on to Telenet and is placed in session with a GTE Telenet-owned host computer. The user interactively composes his message, which is then stored in the host and delivered later when appropriate. The "service point" for electronic mail is central for all users.

Tymshare, for example, collects information on freight car movements from the railroads and delivers it to the shippers. Tymshare also offers travel agencies access to travel providers (airlines, hotel chains, auto rental companies) through its networks. In both these cases, Tymshare is performing a significant set of protocol conversion, language translation and storage functions for its users at Tymshare-owned host processors.

Whether the service points are central, as in the case of GTE Telenet Telemail, or distributed, as in AIS/Net 1, does not in itself have any effect on the utility of the network or its services as seen by the user. It is more a matter of the economics of network deployment and ultimately should be reflected in the costs of the service.

User Problems

How can the users make best use of intersystem data communications? Intersystem data communications problems must be solved if the industrial and commercial worlds are to keep pace with their ability to build computer systems. There are simply too many individual systems now in place for the user community to tolerate any further the lack of orderly and efficient interconnections.

The approach promoted by American Bell in its new Net 1 service can prove effective in solving these problems — as can the competitive offerings. User data processing and communications management should begin to consider how to best use this new kind of capability.

Following are some ideas on how Net 1 or a comparable intelligent network might be used to solve intersystem communications problems.

Large companies tend to evolve multiple independent data systems and networks because of geographical and organizational separations, acquisitions and management support for decentralization of the data processing function. The need for interconnection of these many systems begins to become clear at the point in the evolution of such a decentralized computing environment when one of several problems asserts itself:

- Multiple terminals for different data systems are required at many locations, along with their supporting data networks.
- Intercomputer data exchange

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breaks down either because centralized standards for file formats become too cumbersome to be enforced or standards erode in the face of strong decentralization policies. Systems cannot interchange data.

- Changes in business conditions place new requirements on data systems to which they cannot respond.

This set of problems most commonly arises in multiple-product-line companies that follow a policy of encouraging manufacturing and distribution divisions to develop their own data processing systems and then later decide to reorganize their functions and provide sales and service for multiple product lines from single offices.

The solution to this problem lies in employing a networking system that enables one terminal in each office to access any computer system by an appropriate sign-on procedure.

Of course, if the terminals and host computers are all compatible and of a single manufacture, then this problem can be solved without a new entity. But if they are not, as is frequently the case, then the intelligent network can perform host computer access control and language translation functions. So, too, the network could be employed to support an exchange of files of data between noncompatible host processors with translation and buffering functions performed in the network.

Large companies are best able to implement application language standards and common protocols because the organizational authority to back such movements can be found if the need is strong enough. On the other hand, large companies also attempt to solve these problems by standardizing the computer equipment software used throughout their data processing organizations.

Between Large Companies

Many large companies exchange data on a daily and even minute-to-minute basis in connection with the movement of goods and services. Increasingly often, data originating in the computer systems of one company is destined for the computers of another. There is a strong interest in replacing documentary transfer of this information with direct intercomputer exchanges.

The approaches taken by large companies to implement these exchanges depends upon the amount of experience in automatic documentary data transfer within an industry, the degree of difficulty anticipated in standardization, the strength of industry associations and the possible impact on competitive balance of some members of an industry who are automating while others are not.

Some industries, like banking, have long since achieved a high level of standardization on intercompany messages and are highly automated. Other industries, such as shipping, have more difficulty because of the complexity of the documents to be exchanged (freight bills) and the procedures for handling them.

A cooperatively managed intelligent network can perform a valuable service for a community of large companies that have a day-to-day data exchange requirement. It can interface each company's computers, perform data conversion to a common format, hold data in intermediate storage for delayed delivery and provide alternate delivery paths when individual data systems are out of service. Examples of this kind of network are Bankwire and Fedwire in the banking system and the Association of American Railroads' Clearing System.

Groups of large companies are generally able to succeed in establishing intersystem data communications networks because they have the ability and financial means to join forces in a cooperative venture to work out the procedural and standardization problems. If the small number of large companies that typically dominate an industry agree on an intersystem standard and stand behind a network plan, it is very difficult for the smaller organizations in the industry to refuse agreement. AIS/Net 1 availability should spur even more of these systems.

Multisupplier Market

The most important new ground for AIS/Net 1 will probably be in marketplaces where dozens to hun-

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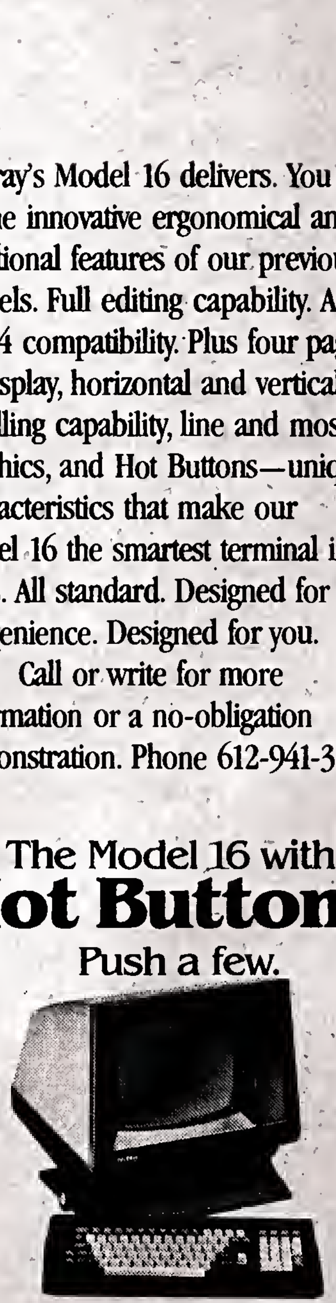

TELERAY
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BOX 24064 MINNEAPOLIS, MINN. 55424

dreds of suppliers deal with thousands of customers. The insurance, travel and auto parts industries are good examples.

In these marketplaces, the customers, typically small agencies or retail stores, have to interchange data with their suppliers on a daily basis. An insurance agency may deal with five to 10 different insurance companies; a travel agency with a dozen airlines, bus companies, auto rental firms and hundreds of hotels and motels; and auto parts dealers with hundreds of manufacturers and distributors.

'The most important new ground for AIS/Net 1 will probably be in marketplaces where dozens to hundreds of suppliers deal with thousands of customers.'

An intelligent data communications network can perform a valuable service for a multisupplier market. While such a network can provide the same kinds of functions as described for applications within and between large companies, the nature of a market of many small suppliers and customers is different because of the standardization problems.

Application-language standards can generally be worked out in a large company or among a small group of large companies. But the same objective in an industry with hundreds of suppliers and thousands of customers is far more difficult. So the network must do its job without the benefit of a common language.

A customer would sign on the network and request connection to a particular supplier. That much would be standard. But the interaction between the customer at his terminal and the supplier's computer might well be different from supplier to supplier. An intelligent network can facilitate this process by making supplier-specific prompting software readily available to each customer and performing many useful services. But multisupplier-market networks will probably remain polyglot for some time to come.

Some Conclusions

AIS/Net 1 is ideally suited for multisupplier markets. The problems of capital investment have been solved by American Bell's ability to invest in its facilities. The technology should lend itself well to solution of the problems of multisupplier-system interfacing.

One would hope the users can come to agreement on application-language standards.

The often sticky question of who controls a multiuser network has been largely finessed by the nature of the service offering.

Even billing for service can be rendered directly to each user by the network. As a result, there is virtually no need for an administrative function.

AIS/Net 1 should force open the door on a new era in data communications, where the problems of intercomputer communications are fully solved and it is possible for computers and terminals to exchange data with the facility of telephone call placement. Whether this goal will be reached and how long it will take will depend to a large extent on the response of the user community to this new service and its competitors.

In particular, users' ability to carry out extensive intercomputer communications will depend as much on application-language standardization as anything else. The providers of data communications network services will offer the underlying technology, but the end users must finish the task.

About the Author

Walter Levy is president of New York-based Edgewood Computer Associates, Inc., a consulting firm specializing in assisting both end users and vendors in the areas of data communications, local-area networking and telecommunications.

Levy has been involved in the data communications field for more than 25 years and has been responsible for a dozen large-scale data communications systems implementations.

He holds a master's degree from the Wharton School.

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EDITORIAL

Cause for Outrage

Despite privacy, legal and institutional concerns, the Internal Revenue Service (IRS) is proceeding with a plan to use its computers to help the Selective Service enforce military registration [CW, Aug. 23].

Computerworld will not use this space to expound on the moral issues raised by draft registration, issues now in full debate in courtrooms around the country, as the first of many registration avoiders are brought to trial. But just as we would not counsel anyone to break the law, we cannot condone the illegal use of computerized tax files to hunt down and drag those young men before the bar of justice.

It is public record that the IRS fears that its role in the draft enforcement program might be illegal and that the agency at some point might have to halt its participation or at least limit it in such a way as will make the program almost completely ineffective. So why is the agency going ahead?

Because the Reagan administration is under a lot of pressure to handle the growing problem of nonregistration. The information-stuffed IRS files, all neatly organized by name and address and Social Security numbers, were just too great a temptation to a panicky bureaucracy.

There are laws governing the disclosure of individual tax records — laws that the present administration seems to be treating in a decidedly cavalier manner. We would have hoped that those responsible for overseeing the high-technology recordkeeping capabilities of the IRS — whose files affect just about every living American — would have at least minimal misgivings about using their computers for a project apparently justified only by political expediency and the most tortuous of legal argument.

The time may come when the IRS will face a backlash of public opinion against the high-handed government use of computers and personal information in such Big Brother fashion. What we fear most at the present time, however, is that these outrageous government tactics jeopardize the future of almost everyone in the DP community, whose reputations may be dirtied by the irresponsible actions of a few of their federal counterparts.

DATA PAST

Five Years Ago
Aug. 29, 1977

MILAN, Italy — An armed terrorist group was still at large, bombing corporate and state computer centers here.

The group, called Unita Combattenti Communiste, attacked 10 such centers in the previous 10 months.

This wave of political computer center bombings was "unprecedented," according to Donn B. Parker, a computer crime expert from SRI International.

ALBANY, N.Y. — Then New York State Tax Commissioner Thomas A. Lynch declared a moratorium on audits and assessments on DP software and services at a taxation hearing.

Lynch, however, instructed those present to remit to the state any sales taxes they had already collected from customers.

Ten Years Ago
Aug. 30, 1972

MIAMI — The Republicans joined the Democrats in deploring the idea of a national data bank, but the Republican platform adopted here stopped far short of the Democratic views on the issue of privacy.

While the Republicans made no mention of the citizen's rights to inspect files, the Democrats had called for access to all government and commercial data files maintained on individuals by those individuals.

BETHESDA, Md. — It may be too late to stop the trend toward the use of the Social Security number as a universal identifier, a government advisory committee was told here recently.

The committee was studying various implications of this trend, including invasions of privacy.

'Judge Greene asked me to sit in, too . . .'

LETTERS

Required Reading

"The Real Cost of DP Professionals" [CW, July 19] should be required reading for all who are concerned with staffing, productivity and the economics of getting things done under time and cost control in a DP shop. It should also be read by all programmers and project leaders, most of whom dramatically underestimate their costs to their organization in terms of dollars per hour of delivered service.

While each of us may disagree with one or more of the author's assumptions (we disagree with his assignment of overtime costs in Figure 3 to "best case" rather than "worst case"), the assumptions and notes are all there for each reader to choose from in building his own case study.

All in all, an excellent job of clearly detailing all the cost factors supporting the growing understanding that in-house staff is, in many cases, not only less controllable and less flexible, but more expensive than contract labor.

Robert J. Brown
Vice-President
Computer Dynamics, Inc.
Los Angeles, Calif.

Unrealistic Picture

Stephen Plotkin's article "The Real Cost of DP Professionals" presented an interesting but biased picture of employee costs in the DP industry.

I find it strange that the word "inflation" was not used once in an article attempting to project employment costs through a five-year period. Equally strange is the statement, "for the purposes of this analysis, we shall disregard . . . levels of proficiency."

With these omissions, how can hourly rates do anything but rise over any period? It only takes a 3% annual increase in productivity, coupled with 6% inflation, to continually lower the hourly cost of the individual receiving an 8% annual raise. And why give someone a 15% raise without a compensating increase in proficiency? What nonsense to judge both situations as equal.

I wondered why such an unrealistic view was being presented, until I read the author's credits. It would have been shocking if Plotkin, director of marketing for a consulting firm, had arrived at a conclusion other than that consultants are cheaper than employees.

David W. Dick
Senior Programmer
Murphy Motor Freight Lines, Inc.
St. Paul, Minn.

Simplicity's Price

For the data center managers who follow the advice in Jack Stone's Human Connection column titled "Simple Code Pays Off" [CW, Aug. 2], there must be an automatic code generator somewhere to solve your programming techniques problem.

We can standardize our programs and drive our good programmers out due to lack of interest, creativity and imagination. We can refuse to try the new programming techniques like artifical intelligence to make life easier for our users, but at what price? The price of training programmers until they feel stymied and leave.

Simple is easy to fix, but it requires simple programmers and simple systems and I don't think most programmers are simple and like to build simple systems. You want simple solutions to complex business problems. That does not compute.

Bill Pearce
Programming Supervisor
Ideco Division
Dresser Industries
Beaumont, Texas

SOFTLINE/Werner L. Frank‡

Micro Software: From Author to User

The proliferation of microcomputers by the hundreds of thousands for desktop and personal use has generated a substantial new retail software market.

Until recently, software for sale was primarily a sophisticated offering to mainframe and minicomputer installations — more than 80% to IBM configurations and look-alikes. Now the hardware consists of a variety of systems from different manufacturers where the underlying bond, if present, may be a common CPU chip, a portable operating system or a standard programming language.

Other dramatic changes in this marketplace are in the software product price and the conditions of sale. Contrasting with the five-figure prices of upper-end products, which are usually available on a fully supported basis, software for entry-level systems is typically priced in only three figures and offer on an "as-is" basis.

The sheer scope of the marketing for low-priced software is a clear indication that the software business is changing dramatically. Successful larger system software product sales are typically measured in several hundred units sold per year. Individual salespeople, with quotas of $400,000 or so, are expected to sell one or two units a month. At this rate, a successful product should generate $5 million per year and yield a 20% pretax income, or $1 million.

To obtain a similar result for low-priced software, it would be necessary to sell 100 times as many systems, or approximately 20,000 units per year. With the 2,000 or more computer retail stores, and not even counting the more than 7,000 Radio Shack outlets, it can readily be seen that this sales level will be achieved if each retailer sells only 10 packages per year, or fewer than one per month. This is certainly a feasible objective.

Economic Model

How does one organize to get that much sales drive behind a specific product?

How does a product get recognized and promoted?

Is there a viable economic model?

The answer to the last question, as we shall see, is a resounding yes.

The burgeoning software market for microprocessors is fueled by a true cottage industry of innovators and contributors. Anyone who has developed a programming skill can readily attempt to write software. Creative programmers are lured by the same vision that often inspires writers, painters and composers: the hope of a smash success.

As in any market promising riches, however, two things typically emerge:

1. A large number of clamorous participants with only a small number of real successes.

2. A substantial infrastructure that comes into being to facilitate the evolution of the idea into a commercial success.

Hence the genesis of the agent, the publisher, the distributor, the racker, the mail-order house, the dealer — all the participants that usually drive up the base cost of a product by a factor of five or more before it reaches the end user or consumer.

Software distribution channels run from the author through the publisher, distributor and dealer to the retail purchaser.

The structure of this network underlies the financial model that is presented here to outline the economics of software distribution. In terms of each participant's share of the retail sales price, the typical financial model looks like this:

Participants	Portion of Retail Price
Authors	10
Publishers	35
Distributors	20
Dealers	35
Retail Price	100

Each entity would like to make 20% pretax income (PTI) on its "piece of the action." This is impossible, however, for everyone except perhaps the author and publisher. As one gets closer to the retail level, marketing concessions are usually made. The practice of volume purchasing and discounting may allow the distributor and dealer to achieve only 20 points of profit between them. Figure 1 represents the nominal available expense and profit levels for each participant, assuming that retail list prices are maintained.

	Sales $	Expenses	PTI	% PTI
Author	10	8	2	20
Publisher	45	26	9	20
Distributor	65	13	7	11
Dealer	100	20	15	15
Total		**67**	**33**	

Figure 1

		Retail Price	
	Model	**$200**	**$400**
Net Revenue @45%		**$ 90**	**$180**
Expenses			
Royalty	(10% of Retail)	$ 20	$ 40
Manufacturing	($15 per unit)	15	15
Advertising	($15 per unit)	15	15
Marketing/Sales	(15% of revenue)	13	27
Administration	(10% of revenue)	9	18
Pretax Profit		18	65
% PTI/Revenue		20%	36%

Figure 2

Now to appreciate the leverage of success, let us look at the results for each participant for several models based on the author's costs for development of the software at $50,000 and $100,000, respectively. The annual sales volume is represented first as 6,250 and then as 12,500 copies at $200 each, yielding $1.25 million and $2.5 million total sales, respectively.

The author would therefore receive 10% of the sales dollars, or $125,000 and $250,000, respectively. The author's benefit is as follows:

Cost of Development	Author's Pretax Income	
	6,250 Sold	12,500 Sold
$ 50,000	$75,000	$200,000
100,000	25,000	150,000

While the model dictates a 20% pretax income, the author's actual profit percentage is highly leveraged as a function of sales because of the fixed-cost base assumed for development. At $100,000 of development cost and a sales level of 6,250 units, the profit before tax is indeed 20%, but for sales of 12,500 units, there is a dramatic pretax income of 60%.

Now consider the publisher. The

(Continued on Page 38)

HUMAN CONNECTION/Jack Stone‡

All 'A-OK' With Your Terminal Operators?

If you are into Sunday talk shows on the telly, you may have seen a rather bizarre ad — sponsored by a famous computer manufacturer — whose story line, as best I can recollect, goes something like this:

The time: Now.

The place: A large, rather plush office, which resembles a receptionist's area. A small business micro sits on a broad-planed desk.

The background voice: A mellifluous incantation, continually espousing the joys of business computation to the tunes of a string ensemble.

The action: A friendly-looking, portly, middle-aged woman — presumably a grandmother three times over — enters center stage. The voice lets us know, in popular terms, that our heroine is interfacing with a micro for the very first time.

Then, suddenly, ever so slight a frown appears on her sweet face (evidencing, I suppose, concern about the psychological threat presented by the provocative computer).

This is the first article in a series, "Trials of a New Terminal Operator," coauthored with Joanne Barker.

Dauntlessly, she sidles over to the machine and touches it lightly (was it a caress?).

(I was laughing so hard that I missed a small part of the ad. The next scene I recall was this:)

She sits in front of the tube, gazing wonderingly at the multicolored "self-instructional" manual off to her side. She enters command codes and the machine responds; she continues for a time and the frown gradually phases into a beaming smile.

A compatriot trots in, issues a "How ya' doin" smile and (if you can believe it) Wonder Senior Woman answers with a hand raised high, the thumb and forefinger formed into an "A-OK" circle (just like Clark Gable did it in the movie "Test Pilot").

Now then, we all know that television advertising takes considerable license with the facts, but I believe this vendor has gone too far. It is telling me, in effect, that if I were to organize a hotshot operations team of 100 grandmothers in the Washington, D.C. Stadium Starplex, each with a personal CRT terminal and "do-it-by-the-numbers" computer guide on her lap, that the vast majority would be capable of threading their way through the hierarchical command chains and successfully executing an application program — without assistance!

I have no objective proof, but my intuition tells me that this group will not function quite like the varsity team that computer center managers are looking for.

My TV viewing experience encouraged me to look more closely at the real situation facing new terminal users. So I am beginning a new series and have called upon Joanne Barker for her assistance. Readers may recall my interview with her on this subject last year ["On-the-Job Training May Not Be Enough," CW, July 20, 1981). In this series, I will sidestep the viewpoint of a Madison Avenue pitchperson and take the perspective of the newcomer terminal operator who hopes to gain a long-term career from the experience.

Which leads to this question: How would you feel if you were a new employee without any data processing background — save handling your personal bills — who was assigned to a computerspeak terminal for entering, retrieving and processing data from a large-scale system?

Would you see the task as a challenge and look forward eargerly to interfacing with the machinery? Or would you be apprehensive about your possible failure to understand terminal functions?

We will be dealing with these and related matters in the series.

Letters

Ludicrous Subject

Hey, what ever happened to free enterprise and the highly touted law of supply and demand ["Fending Off Headhunters," CW, Aug. 9]? Why all this heavy-handed attitude toward headhunters? I've always told members of my staff, in effect (to paraphrase the new Chrysler Corp. commercial), "If you can find a better job, take it!"

What is the difference between deregulating the oil, gas, airline, communications and other industries and letting the shortage of good systems and DP talent cause an appropriate adjustment in supply (more analysts with more training) and demand (more reward for quality production)?

I am truly shocked that there are employers so niggardly and lacking in class as to forbid conversing with headhunters "on company time."

A company that is on the level with its employees has nothing to fear and should benefit over the long run by attitudes that enhance career growth.

Finally, are we to presume that none of all those high-level musical-chairs games are ever instigated by headhunters (except *there* they are called "executive consultants") on company time?

The whole subject is rather ludicrous.

Tom O'Connor
Nashua, N.H.

Ever the Same

The Aug. 9 editorial, "Don't Quote Me," was most appropriate. Any reader having a problem understanding the message should read Robert V. Jacobson's accompanying commentary.

The editorial would have been timely had it been written 30 years ago. Furthermore, the message applies to the "others" — large management consulting firms and major regional certified public accounting firms.

I am aware of a Dallas-based corporation that relieved four DP managers of their duties in five years. Perhaps it was coincidental that a local management consulting firm had submitted its report only two months prior to the last DP manager's dismissal. Even more ironic was the report's content, which merely restated that manager's own observations and requests to upper management. The primary consultant's credentials consisted of the fact that he was an ex-IBM salesman.

I doubt that the situation will change significantly in the next 30 years. The unqualified will continue with their "hatchet jobs," the qualified will continue to disappear into "never-never land" and the Big Eight (et al) firms will flourish.

Robert R. Cromer
Irving, Texas

Software For Micros

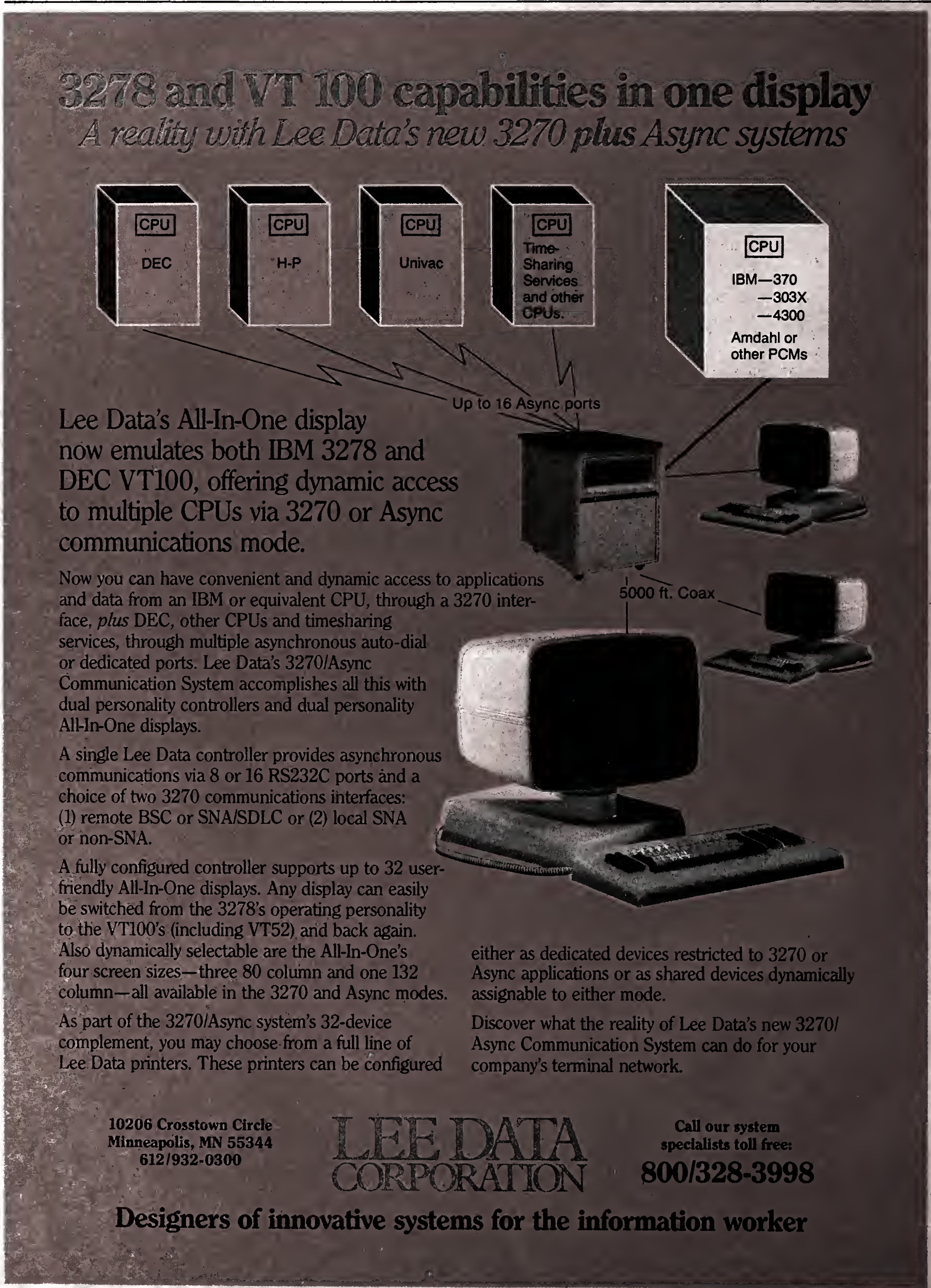
(Continued from Page 37)

publishing organization has a mixture of fixed costs and variable costs. This fact also leads to unusual leverage. Consider, for example, the impact on the cost structure of two products, one priced at $200 and the second at $400. The packaging (that is, manufacturing) and the advertising costs per unit are essentially the same, regardless of price. The consequences can be seen from the calculations for the publisher (see Figure 2 on Page 37), assuming sales volume of about 500 units or more per month. The pretax income presented by the model rises from the nominal 20% for the $200 package to 36% for the higher priced software.

The remaining constituents of the marketing process, the distributor and dealer, have a tough time of it since they face the reality of a competitive marketplace with no particular leveraging aspect. Hence, their costs and profits must be covered by approximately 55 points of the retail sales price, probably split between them at a ratio of 60 to 40, respectively.

In a subsequent column, we will consider the sensitivity of this economic model to product volume sales as well as the implications of coupling software with hardware sales.

Frank is executive vice-president of Informatics General Corp. in Woodland Hills, Calif.



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The Missing Link in System Specs — Part 1

Manual Must Give User, Analyst Views

By Louis Fried
Special to CW‡

There is a need for a common understanding among users and systems designers as to how a piece of software under development will fulfill specified requirements. In the first half of this two-part series, Louis Fried — program director of SRI International, Inc.'s Advanced Computer Systems Department, which performs research and consulting in the computer field — details the traditional obstacles to this "meeting of the minds" and explains how proper use of a user manual can help bridge the gap.

Next week, Fried will continue to examine the development of an effective user manual.

As systems have become more complex, it has become increasingly difficult for the eventual user to understand the systems analyst's definition of his requirements during the design of the new software system. This situation has been exacerbated by the growing trend toward on-line interactive systems.

A functional requirements specification prepared in data processing terms is almost unintelligible to the average user. This has deepened and widened the gap between the analyst and the user to the point that it is becoming highly improbable that the user really understands what he is approving for future delivery.

Repeated studies have shown that the cost of repairing an error in system design increases drastically as the development cycle moves toward completion. Failure to obtain knowledgeable concurrence from the user in early stages of system development substantially increases the risk of discovering design errors later.

In order to reduce the risk of such project problems, it is necessary to provide the missing link between the user and the analyst. This link must ensure that the user understands what will be delivered at system implementation and that the user will have a method to determine that the product meets expectations.

It is usual in the system development life cycle to identify two major phases early in the life of the project. These are the requirements definition and the system specification phases. The first generally deals with what the user wants to accomplish. It documents the objectives of the system, including information such as the kinds of outputs desired, the data base or file contents, the operating environment, the users and user locations and performance requirements.

The user is expected to review and approve the requirements definition prior to further work on the system. After such approval, the designers prepare the system specification. This is a description of how the requirements will be met. It generally consists of a conceptual design that deals with the entire system and a functional specification of the system and program modules.

Although the system specification is prepared in technical language, the user is expected to approve this specification before further development is done.

And there's the rub.

The document that describes *what* the user wants is in user terms. The document that describes *how* the system will perform what the user wants is in technical terms. The user is asked to approve both *what* and *how* without being able to understand the *how*.

The missing link is clearly a document that supports two views of the system. It must present a view of how the system will work in user language, yet it must be detailed enough to provide a functional specification as a foundation for describing program modules. Furthermore, it must provide the user with a baseline for evaluating the system that is eventually delivered to ensure that it meets requirements before implementation.

Providing the Bridge

This document has been around for a long time, but it has generally been prepared near the end of the development cycle. In fact, in many cases it has been prepared as an afterthought. Very simply, this document is called the user manual, and in the current world of developing interactive, on-line systems for users it finds a new value in providing the bridge between the user and analyst as a concluding document in the requirements definition phase of system development.

The user manual has traditionally been a collection of procedures, report and screen layouts and reference material provided to supplement the training of users to operate the system. As such, it has tended to approach procedures in a static manner that is inadequate to describe the dynamic environment of the interactive system. However, the manual often had one major facet that was ignored by all other documentation of the system . . . it was user-task-oriented.

It is this user-task-orientation that provides the view of *how* the system will work.

(Continued on Page 40)

Latest 'Mantis' Lets Users Access More Programs

CINCINNATI — Cincom Systems, Inc. has enhanced its Mantis application development system to include a high-level logical view of multiple types of files and end-user access to multiple types of programs.

Release 3.5 of Mantis is available for users of IBM and plug-compatible systems running under OS and DOS. It provides a logical view of multiple types of files, including Mantis files, IBM Vsam files and Cincom Total data base management system files, the vendor explained. Both fixed- and variable-length records are said to be supported.

For the end user, Mantis 3.5 provides access to multiple types of programs from a single menu custom designed for them, according to Cincom.

Other enhancements to Mantis are designed to improve data validation procedures, simplify the error-correction process, provide stricter security controls for the data base administrator and accommodate certain country-specific display requirements.

The Vsam Logical View is priced separately at $5,000 for both OS and DOS users. All other features of Mantis Release 3.5 are provided free of charge to existing Mantis users. For new users, the purchase price of Mantis Release 3.5 ranges from $14,000 to $54,000, depending on the operating system, the teleprocessing monitor and the number of attached terminals. Lease purchase pricing varies from $850 to $2,250 per month. Installment purchase plans also are available, the vendor said from 2300 Montana Ave., Cincinnati, Ohio 45211.

'Look' 6.1B Offers CICS Monitor

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 6.1B of Look, its performance measurement system for IBM and plug-compatible mainframes running under OS. A separate version of Look is available for IBM's DOS/VS(E) environment.

Release 6.1B reportedly features a CICS monitor option to display on-line CICS's resource utilization under MVS. Two interfaces support access to the CICS monitor; one is Look's real-time monitor, general IBM 3270 interface, the other is a CICS interface. The latter supports additional facilities for storing output, scrolling though long display and restricting the contents of displays, according to the vendor.

The permanent license fee for Look OS starts at $7,000, the DOS version costs $5500 and the Look/CICS option is priced at $10,000. ADR is located at Rt. 206 & Orchard Road CN-8, Princeton, N.J. 08540.

NCR Offers Aid For VRX Users On V-8500, V-8600

DAYTON, Ohio — NCR Corp. has announced a software package designed to provide users of its Virtual Resource Executive (VRX)-based systems with interactive program development, processing and maintenance.

Called the Interactive Virtual System (IVS), the software is comprised of seven modules and one VRX-integrated module that reportedly can be employed in a variety of combinations to meet individual user requirements. It runs on any NCR V-8500 or V-8600 system operating under Release 9 of the VRX operating system. All interactive processes will run concurrent with, and independent of, batch and on-line operations under VRX, the vendor said.

NCR claimed that applications currently running under VRX will run in conjunction with IVS applications without reprogramming. The IVS software is intended to enable a user to complete a program development cycle in a single interactive session. This includes creating a source file, compiling, link editing, loading and testing. If necessary, the user can debug the program dynamically at the symbolic level using the same symbolic references for data and routines as the original program, the vendor noted. Any changes can be edited into the source file and the file can be saved when the session is finished.

Monthly license fees for the unbundled IVS modules range from $28 to $160, the vendor said from Dayton, Ohio 45479.

We're Looking for DBMS Sagas

Do either of the following scenarios seem familiar?

- You have installed a data base management system (DBMS). What's next — how do you manage this large system? What type of training is necessary for your current staff? Do you need to hire new people who are familiar with this type of product? Short of turning them into programmers, what is the best way to help your users take advantage of the software's capabilities?
- You have decided that it is time to take the big step and invest in a DBMS. Which one do you choose? How do you determine what capabilities you need and which DBMS will best fulfill your organization's requirements?

If either of these situations rings a bell with you, then you are exactly the person we want to hear from for the upcoming *Computerworld* Special Report on DBMS, which will appear in the Oct. 28 issue.

CW is interested in including both user experiences and tutorials about DBMS. Tell us how you have faced either of the above situations and what your solutions to problems have been. Describe how a DBMS has affected your organization in terms of areas such as efficiency, productivity, staffing and your relationship with your users.

The articles should be typed, double-spaced and should be between four and seven pages long. Please include any accompanying photographs or artwork (originals wherever possible).

The deadline for submissions is Oct 1. Articles should be sent to Susan Blakeney, *Computerworld* Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Further details on topics appropriate for the Special Report can be obtained by calling *Computerworld* at (617) 879-0700 and requesting a two-page handout we have prepared.

EXTRA!

"You better get it together 'cause the revolution's here . . ."

from "Something in the Air"
by Thunderclap Newman

The hardware revolution that is. Back in the fifties, industry people were saying, "The world will only need 11 computers." Now, in the eighties, we're producing more than a million keyboards a year, and hooking them up to computers. Hardware is proliferating faster than anyone could have anticipated 30 years ago — it really is a revolution.

And this October 27th's *Computerworld Extra!* on "Computer Systems" will give you all the ammunition you need to be in the front ranks. You'll get the whole picture in terms of just what this explosion in new hardware is beginning to mean to the DP/MIS person.

This October's *Extra!* is going to put the advances in hardware and the implications of those advances together in a meaningful way for the DP/MIS manager. Take a look at just some of the topics you'll be reading about this Fall:

- A close — and candid — look at the Japanese challenge
- New computer systems — these articles will span everything from a computer you can throw in your briefcase right up through 32-bit and mainframes
- Future chip technologies
- Leasing
- Peripherals — new technologies and advances in everything that hooks up to a CPU
- Database machines
- Personal computers invading the corporate environment
- Graphics
- Lasers

And you'll get a great story on the Epcot (Experimental Prototype Community of Tomorrow) Center — the new amusement park opening in September with computer technology by Sperry Univac. This is computer technology that will affect the community of tomorrow.

If you sell to Vice Presidents, Directors, DP Managers and other MIS professionals, here's where you'll find your buyers this October 27th. *Computerworld Extra!* will be read by more than half-a-million computer-involved readers including 116,988 paid subscribers, (ABC 12/31/81) and 423,720 pass-along readers (Becker Research Corporation).

CW Extra! advertising close is September 17 and we'll be glad to give you more advertising information — as well as complete details on our subscribers and readers. Just contact your local *Computerworld* sales office or call Don Fagan, Vice President Sales, at (800) 343-6474. In Massachusetts call (617) 879-0700.

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'SAR' for MVS Manages Sysout

AGOURA, Calif. — Essential Software has announced the Sysout Archival and Retrieval package (SAR) for users of IBM's MVS operating system and IBM's System Productivity Facility (SPF) program product.

SAR manages all types of sysout and is especially suited to JCL and syslog data. The package can archive weeks, months or years worth of sysout using both tapes and disks for storage, the vendor said.

Multiple file stacking is used to reduce the number of tapes required. As sysout is archived, the package scans JCL listings for error conditions. A user exit is available to change or add to the default error conditions, the vendor said.

Retrieval of sysout is performed using the full-screen services of SPF. Users are presented with menus to select the desired sysout. Complete SPF browse capabilities are provided and the user may select sysout for printing, the vendor said.

SAR costs $5,000 and includes one year of maintenance and support. The vendor is located at 6210 Federal St., Agoura, Calif. 91301.

Link Necessary For System Specs

(Continued from Page 39)

When used for the purpose of completing the requirements definition, the user manual should be assumed to be in draft form, subject to minor modifications prior to final release.

User Manual Format

The user manual should begin with an overview of the objectives and environment of the system and a description of how the user tasks encompassed by the system relate to each other. Following this introductory material, the manual should describe each task that users will perform. These task descriptions should indicate all steps of the dialogue between the user and the system. This can be approached in several ways, including a "playscript" format that accompanies screen layouts, forms samples or report layouts.

The descriptions should include information such as user input, the system's response to the user, where entry data comes from, edit rules, computations performed by the system, feedback the system provides to the user and error conditions.

It also should detail functions and aids the system provides for users, the transactions that will be most frequently used, the normal sequence of tasks and screen formats.

The above list is not comprehensive, but is intended to provide the "flavor" of the contents of the manual that would be necessary to adequately describe user interactions with an on-line system. The system designer must be sensitive to the level of user understanding and add such information as will make the procedures clear to the user.

Louis Fried is program director of the Advanced Computer Systems Department at SRI International, Inc. in Menlo Park, Calif. His group performs research and consulting in the computer field.

These Media Management devices from Graham Magnetics keep your computer tapes performing better, longer.

Graham Magnetics' leadership position in computer tape technology has led to the development of three remarkable devices, each designed to do a specific job to reduce drop-outs, tape damage, stoppages and resulting system downtime:

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The Protector*—This patented cleaner employs vacuum technology to remove error-causing debris, including micron-sized particles, from the inside of self-loading cartridges. It automatically adjusts to clean most cartridges in two minutes or less.

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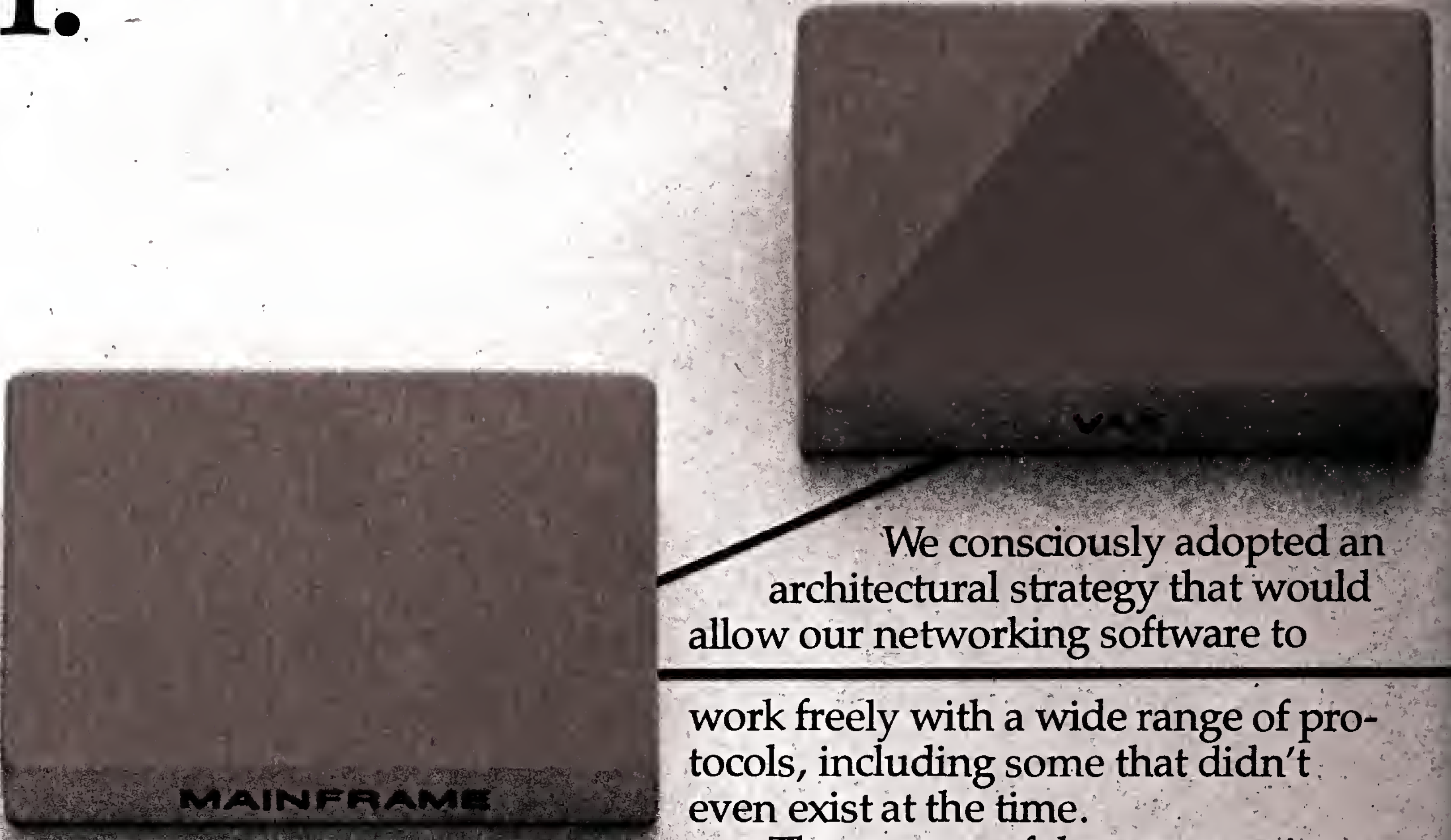


By now, everyone understands the need for standard communications protocols. Without them, an electronic Tower of Babel would surely ensue. But there have to be different standards for different networks. A local-area network is different from a wide-area network. A public network is different from a private one.

No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

Our goal is to offer our customers a range of standards to achieve any combination of networking objectives. And we've been pursuing that goal for many years.

A forward-thinking strategy.

When we first developed our networking architecture, we understood the need for flexibility. We consciously adopted an architectural strategy that would allow our networking software to work freely with a wide range of protocols, including some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

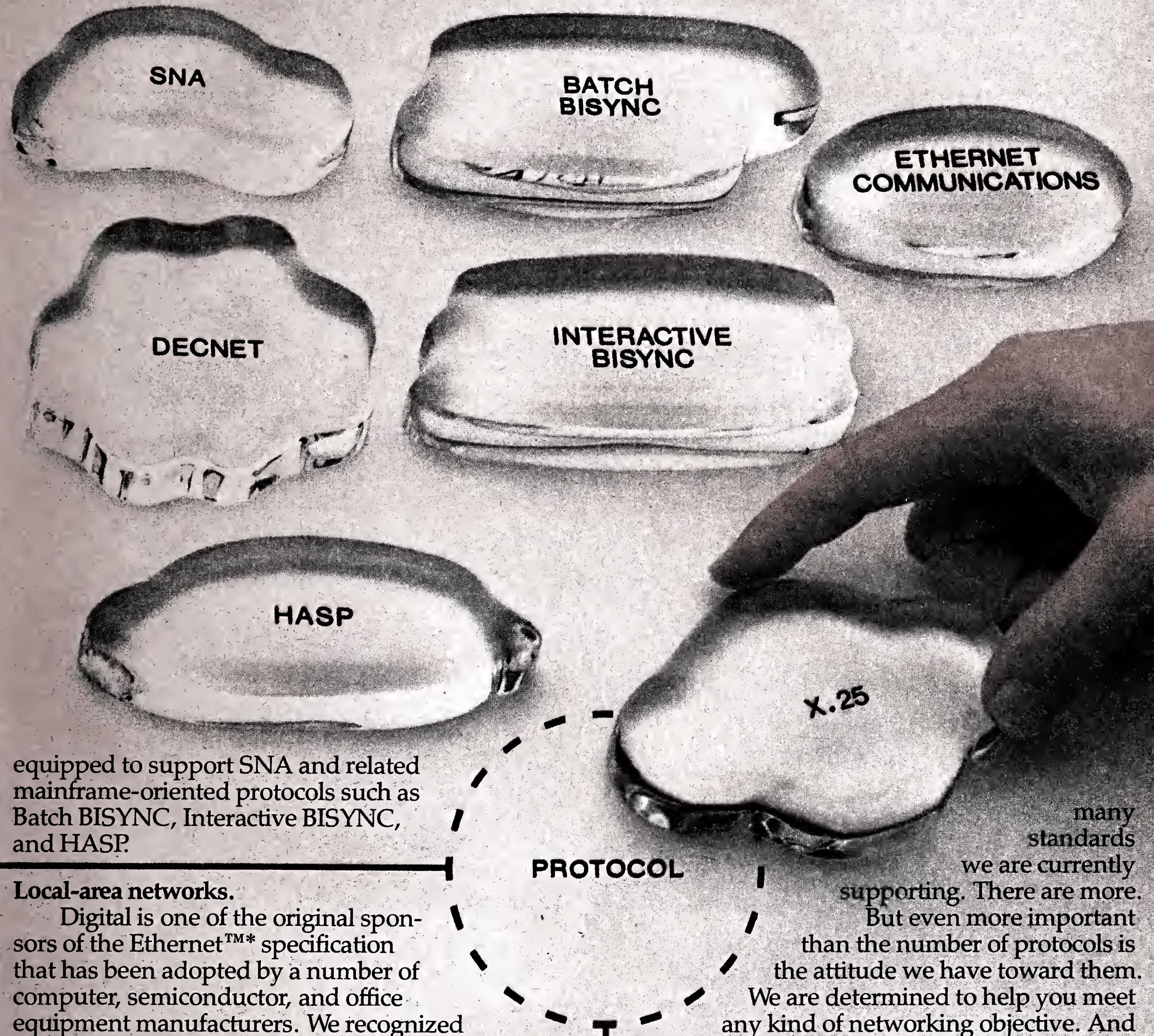
X.25 and other public networks.

Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

But when used with our computers, X.25 is much more than a simple link. We can provide you with the higher-level protocols that will take your systems beyond mere communications and into the sophisticated functionality that has made us a leader in networking software.

Hierarchical networks.

Even though we prefer to implement more flexible distributed networks, we are amply



equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

Digital is one of the original sponsors of the Ethernet™* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

Distributed data processing networks.

DECnet,™ Digital's proprietary networking software, is based on a layered architecture. This is the same architectural approach followed in the model proposed by ISO. Our DECnet offers a wide range of quality networking products, products that allow such sophisticated options as adaptive path routing, down-line loading, and enhanced network management capabilities.

And so on.

We have listed a few of the many standards we are currently supporting. There are more. But even more important than the number of protocols is the attitude we have toward them. We are determined to help you meet any kind of networking objective. And our capabilities in that regard are as far-reaching as they are farsighted.

So if you're planning a network, don't make the mistake of planning just for the present. Talk to the people who can meet your current needs and still keep your options open for the future. Talk to us.

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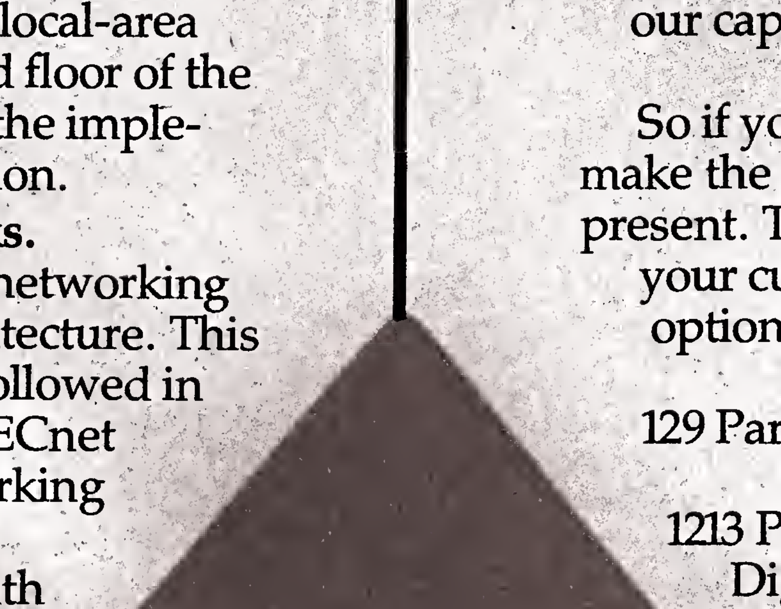

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JCL-Level Flowcharting Processes JOB SB, Proc JCL

SAN JOSE, Calif. — A job control language (JCL)-level flowcharting package is the latest offering from Diversified Software Systems, Inc. (DSSI).

Flowcharter reportedly processes both JOB SB and Proc JCL with no changes to JCL. It also produces structured JCL listings and a complete data set cross-reference, according to the vendor.

The built-in SELECT facility is used when production JCL is stored in disk libraries, enabling the user to identify one or more jobs for charting by specifying a member name, range of names, a masking or any combination of the three, a vendor spokesman said.

Flowcharter operates on any IBM OS(VS) or compatible system. The purchase price is $6,995 and and it rents for $260/mo. DSSI is located at Suite 205, 996 Minnesota Ave., San Jose, Calif. 95125.

Package Controls Output Printing At Remote Sites

SANTA CLARA, Calif. — Memorex Corp. has introduced a software package designed to control computer output printing at local and remote sites.

The Distributed Printing System (DPS) can reportedly give the remote printer user printing control and flexibility equal to that of a computer center with local and remote job entry printers. It also provides control of the printer network through commands issued from operator consoles and IBM TSO terminals, IBM Job-Entry System 2 (JES2) and from user-written programs, according to the vendor.

DPS runs as an IBM Vtam application and can be used by any computer operator familiar with the structure of JES commands. It is also said to offer a variety of commands to control both printers and reports, as well as multiple levels of password protection for security.

This product is available immediately for $10,000, Memorex said from San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Financial Tool Fits System/38

PLYMOUTH, Mich. — Louis A. Wright & Associates has announced a financial package designed for IBM's System/38 processor. Modules include general ledger and financial reporting, payroll and labor reporting, accounts payable, fixed assets and depreciation accounting.

The firm is also offering DSS/38, a distribution software system that includes order processing, invoicing, accounts receivables, sales analysis, inventory and open purchase orders modules.

The financial package costs $6,000; DSS/38 costs $30,000 from Wright, 1158 S. Main, Plymouth, Mich. 48170.

Cross-Referencing Made for System/38

JACKSON, Mich. — A field-to-file and file-to-program cross-referencing system for use on the IBM System/38 has been announced by Alro Computer Software Services, Inc.

Doc-U-File/38 is said to produce two alphabetic listings that document where and how all fields, files and data areas are used by all programs on the system.

The software costs $499 from Alro through P.O. Box 927, 3100 E. High St., Jackson, Mich. 49204.

VISUAL GRAPHICS TERMINALS.
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High quality graphics doesn't have to be expensive. The new VISUAL 500 and VISUAL 550 terminals emulate the Tektronix® 4010 but cost only about half as much. And they have 768 x 585 resolution for sharp text and graphics display on a large 14" screen.

Both the VISUAL 500 and VISUAL 550 are compatible with standard business, laboratory, and scientific software including PLOT 10,™ DISSPLA,® TELL-A-GRAF,® SAS/GRAPH and DI3000/GRAFMAKER.

Auxiliary Port supports printer/plotters and data tablet.

Advanced graphics features include: Resident vector draw, point plot, rectangle draw, multiple linestyles and patterns with rectangle pattern fill. Raster scan technology provides fast data update and develops a bright display image.

Powerful alphanumeric operation is also provided, displaying 80 characters by 33 lines with separate display memories for alpha and graphics modes. The VISUAL 500 provides switchable emulations of the DEC VT52,® Data General D200, Lear Siegler ADM-3A, and Hazeltine 1500 terminals. The VISUAL 550 is a block mode terminal which complies to the ANSI X3.64 standard.

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'Utilims' Version Checks Data Bases

MONTREAL — Eco Systems Ltd. has announced Version 2.0 of Utilims, its IBM IMS utility. This version of Utilims reportedly enables users to compare data bases, extract selected fields and convert data to hexadecimal or characters.

Utilims' features included the capacity to inquire, print, display and update an IBM IMS data base, whether on-line or in batch mode, Eco Systems said.

Available on a permanent license basis for $10,550, Utilims can be installed on IBM and plug-compatible MVS/370 systems.

Eco Systems is located at Suite 700, 1001 W. De Maisonneuve Blvd., Montreal, Canada H3A 3C8.

ASI Library Utility Fits IBM System/34

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has announced a library transmission utility for IBM's System/34.

The package provides System/34 users with a means of transmitting and receiving any library member. The package can transmit source members, load members, procedures and subroutine members as well as entire libraries from two System/34 processors, the vendor said.

The utility costs $95, the vendor said from Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.

For Use With IBM MVS

Package Automates Syslog Tasks

VICTORIA, B.C. — Syslog Management and Retrieval (SMR), a product designed to control all phases of syslog with IBM MVS systems by automating syslog-related tasks, was announced here by Software Dynamics.

SMR reportedly performs syslog collection and stores the data in compressed format on tape, disk or an IBM 3850 Mass Storage System. Files are separated into daily units, merging any number of records together.

An archival option is available that reportedly allows syslog to be stored on disk for several days and then automatically migrated to any other medium.

Syslog files are deleted automatically after the installation-defined expiry period has passed. Retrieval of syslog records reportedly can be done in batch or interactively from IBM's TSO.

A range of selection options are available.

Exits are provided to allow syslog to be modified prior to storage or after retrieval of selected data, the vendor said. Reports can be produced from any information extracted.

SMR is available at $3,000 for a perpetual license covering all processors in a DP installation, the vendor said, noting that a 30-day free trial of SMR is available.

Software Dynamics is headquartered at 42 Demos Place, Victoria, B.C., Canada V9A 7A7.

'Csar' Enhanced for IBM DOS/VS(E)

ATLANTA — Software Concepts, Inc. has announced Release 1.3 of its Computer Scheduling and Reporting System (Csar) for IBM systems operating under DOS/VS(E).

This release reportedly adds compatibility to IBM's Source Statement Library and Applied Data Research, Inc.'s (ADR) Vollie. Csar also interfaces with IBM's CICS and Interactive Computing and Control Facility, ADR's Panvalet and various other software systems, according to the vendor.

Csar reportedly enables the user to plan a schedule in advance while allowing for adjustments, organize work load for maximum operational effectiveness and control production work load utilizing measurement reports on scheduling achievements.

Csar for DOS users sells for $9,900; it costs $24,500 for OS users, according to the vendor.

Further details are available from Software Concepts at Suite 1450, 250 Piedmont Ave., Atlanta, Ga. 30308.

Archival System Lets IBM Users Store Seldom-Used CMS Files

FALLS CHURCH, Va. — An archival system that reportedly allows users of IBM's VM operating environment to archive their IBM Conversational Monitoring System files has been released here by VM Software, Inc.

VMArchive reportedly provides archiving support for CMS. Users can move seldom-used files to disk or tape archival storage for later retrieval, according to the vendor. Security features are under installation control and archiving can be done on a real-time or deferred basis. Users may list, recall and delete files that have been archived, reported the vendor.

This product has a permanent license fee of $3,000 according to the vendor, which is located at 7777 Leesburg Pike, Falls Church, Va. 22043.

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Package of Features Added to Mark III

ROCKVILLE, Md. — A package of new features has been made available to users of General Electric Information Services Co.'s (Geisco) Honeywell, Inc.-based Mark III remote computing services.

Form and Menu Processing for CRT terminals, Plot III and Tabol Database Manager are designed to improve application productivity in an operations environment, according to a company spokesman. The CRT menu and form layouts can reportedly guide a nontechnical user through entering and accessing computer data, he reported.

Plot III Business Graphics is intended to work with Geisco's Database Management System, its Data Management Inquiry System and with Tabol, a tabular financial-reporting language developed by Geisco, a company spokesman said.

The Tabol Database Manager is said to organize tables of data into a data base without having to create and remember names for specific files.

Costs for these additional offerings are based on client volume. Further details are available from Geisco at 401 N. Washington St., Rockville, Md. 20850.

Model Projects Costs of Leases

NEW YORK — Fox & Co., a certified public accounting firm here, is making available on a time-sharing basis a computer model for projecting costs of a commercial lease over the lifetime of a proposed agreement.

The model is available via Compuserve, Inc.'s time-sharing network. It reportedly projects costs in 14 elements affecting a commercial lease, including such factors as base rent, improvements, escalations and financing costs.

Use of the model is priced on a transaction basis.

Fox & Co. is headquartered at 1211 Ave. of the Americas, New York, N.Y. 10036.

UCC Offers 'Marc' System On T/S Basis

DALLAS — The Marc system, a group of structural engineering programs developed by Marc Analysis Research Corp., has been added to University Computing Co.'s (UCC) product roster.

UCC is offering Marc on a time-sharing basis through its Control Data Corp. Cyber service. It is a general-purpose finite-element program for use in large and complex structural models, according to the vendor.

Marc can be used for the linear elastic analysis of two- and three-dimensional solids, shells and beams and for applications where nonlinear material and geometric effects are needed.

Prices are based on job and volume. UCC can be contacted at 1930 HiLine Drive, Dallas, Texas 75207.

Businesses Get Graphics Aid

HARBOR CITY, Calif. — Business Marketing, Inc. has released a financial and management business graphics package said to be available on most computer configurations with Printronix, Inc. printers.

The package features three types of vectors as well as boxes and bar graphs, circles and pie charts, axes and textual information in, on and around each graph, with several graphs/page.

The software is said to automatically generate weekly, monthly and yearly financial and management business graphs in addition to existing reports.

The package costs $5,000 from Business Marketing, P.O. Box 674, Harbor City, Calif. 90710.

File Manager Fits Drafting Package

MORRISTOWN, N.J. — A multiuser file manager said to handle up to 10 computer-aided drafting workstations has been added to Keuffel & Esser Co.'s computer-aided drafting package.

The Model 4909 is based on the Tektronix, Inc. 4909 and reportedly supports both private user and shared work spaces. Private spaces are protected by user IDs and passwords and multilevel file security techniques.

File security is implemented at the volume level through a master password and at the file level by user ID and passwords, according to the spokesman.

The firm also supplies a read-only memory pack for the file manager that allows users to manipulate data directly with Basic commands used by the workstation rather than the Ascii-format commands required by the IEEE-488 standard, the spokesman said.

Pricing begins at $87,000, according to Keuffel & Esser, which is located at 20 Whippany Road, Morristown, N.J. 07960.

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Because the all-new Teleram 3000 is the first truly portable personal computer that operates everywhere, a Teleram Office is anywhere. Wherever business wants or needs to be.

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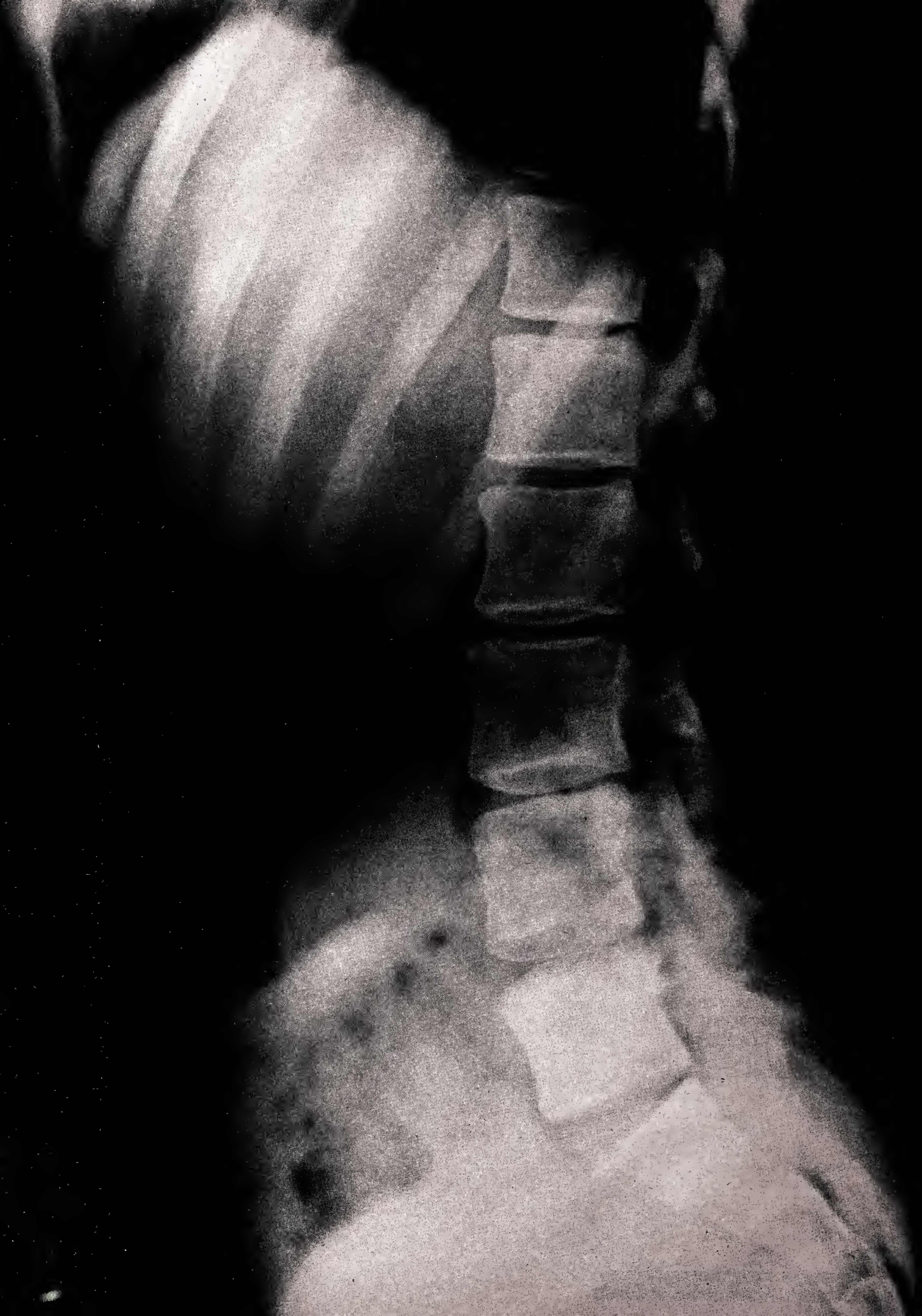

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Freight Subsystem Runs With 'Compu-Rate'

ATLANTA — American Software, Inc. has announced enhancements to its Truck/Car Loading system that reportedly enable the user to specify the relative importance of a number of factors in load preparation.

The system is said to specify replenishment quantities that should be shipped from a source location to a receiving location, taking into account the physical constraints relative to the number of available vehicles.

Enhancements reportedly allow the user to specify the relative importance of weight, cube, pallets and dollar value in preparation of suggested vehicle loads. The software runs on IBM System/34 and larger computers as well as IBM-compatible model. Prices range from $20,000 to $25,000 from 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Transportation Control Out for System/34 Users

METUCHEN, N.J. — Transportation Concepts & Services, Inc. has developed a computerized freight rate maintenance and retrieval subsystem to run with its existing Compu-Rate System for IBM minicomputers and mainframes and Honeywell, Inc. 6000 series computers.

The Compu-Rate XIII Shipment Discount Subsystem reportedly interfaces directly with the Compu-Rate IV multimode automatic rating subsystem. It reportedly enables users to apply discounts directly to the rate for a shipment in a production run, apply discounts to the final charge in a production run and apply discounts either based on historical data for simulation purposes or to actual shipments.

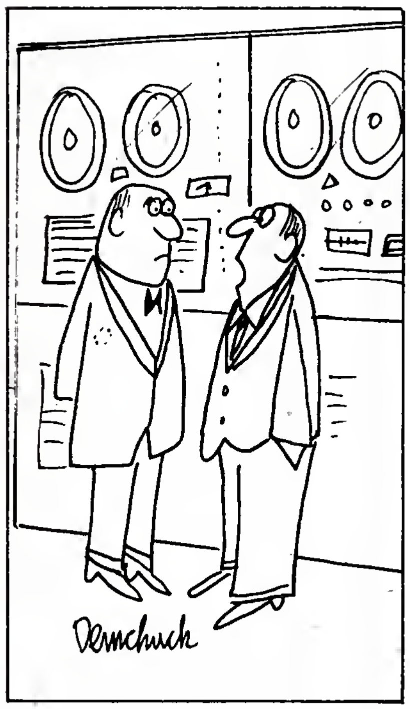
Compu-Rate XIII is available for $11,500. Its vendor is based at 20 Highland Ave., Metuchen, N.J. 08840.

Loading Tool Upgrade Prioritizes Traffic Factors

GRAYSLAKE, Ill. — Ford & Associates, Inc. has released a transportation accounting and distribution management control system designed for use on IBM System/34 and plug-compatibles with interactive terminal support.

The Traffic Management Reporting System (TMRS) is written in Cobol and reportedly provides for multiprofit center, multiwarehouse and multiplant processing. The menu-driven system features on-line data entry, error correction and editing and validation, according to Ford & Associates.

TMRS is base priced at $18,600, according to a spokesman for Ford & Associates, which is based at 133 Center St., Box 402, Grayslake, Ill. 60030.



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Airline Packages Run on HP 3000

READING, Pa. — Dash Group, Inc. has announced two packages for the airline industry that run on Hewlett-Packard Co. HP 3000 computers.

Ticket Stock Control & Auditing reportedly assures control of issuing and auditing ticket stock and is interfaced with several existing applications; it costs $10,000.

A Fixed Asset package will also be available for this vertical market and will be interfaced with existing applications. Fixed Asset costs $5,000.

Dash Group offers 12 packages for the airline industry ranging from $5,000 to $20,000. It can be reached through P.O. Box 8666, Reading, Pa. 19603.

For Property, Casualty Firms

Insurance Package Fits HP 3000

ROCKVILLE, Md. — Isis Corp. has announced an insurance servicing package for property and casualty insurance firms using Hewlett-Packard Co. HP 3000 processors.

Called the Insurance Servicing & Information Systems (Isis) package, the software reportedly can be combined to form an on-line interactive integrated package, or individual modules can be used as stand-alone packages. Available modules are Policy, Claims, Agent, Adjuster and Inspector.

Features include multiple claims analysis, critical mail tracking, automated billing, automated claims payment and a financial audit trail. In all, the package provides more than 70 different management and system tracking reports, the vendor said.

The complete package costs $48,000. Stand-alone modules cost between $9,000 and 12,000, the vendor said from Suite 301, 451 Hungerford Drive, Rockville, Md. 20850.

Loan Package Runs On-Line On HP 3000

CENTURY CITY, Calif. — An on-line, interactive system designed to handle the reporting and monitoring requirements of asset-based lending and commercial loans has been developed by Custom Application Systems, Inc. for the Hewlett-Packard Co. HP 3000 computer.

The Commercial Loan Financing/3000 system was designed for accounts receivable, inventory, special-term and participation loans. The system is said to handle receipts, disbursements and cash advances in addition to tracking loan participation with multiple outside lenders.

In object form, the software costs $50,000 and in source form, $65,000 from 1888 Century Park E., Century City, Calif. 90067.

Library Utility Fits System/34

LITTLE ROCK, Ark. — Arkansas Systems, Inc. is offering a Library Transmission Utility (LTU) for the IBM System/34.

LTU reportedly provides a way to transmit and receive any library modules.

Recompilation of source code reportedly is not necessary. The utility costs $95 from Arkansas Systems, Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.

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- But suppose you need more storage. TeleVideo's next model up, the TS 802H, gives you all the same features of the TS 802. But instead of two floppy diskettes, it uses one floppy diskette and a 5¼-inch Winchester hard disk to give you 9.6 million bytes of unformatted storage capacity—nearly 10 times the storage for only twice the price of the TS 802.

COMPUTERS THAT GROW AS YOUR NEEDS GROW.

The TS 802 and TS 802H are more than just single-user, stand alone computers.

When it's time to expand, simply plug them into TeleVideo's more powerful TS 806 or TS 816 multi-user, multi-tasking systems. The TS 802s then become intelligent, fast response satellite stations.

And because each has its own CPU, there's none of the degradation of throughput and contention for a single CPU that slows down the typical shared system. Each user maintains full processing capability in a shared file environment.

With TeleVideo, there's no obsolescence. Because of the unique multi-CPU architecture and TeleVideo's multi-tasking software, the TS 802s do not have to be replaced as your data processing needs grow.

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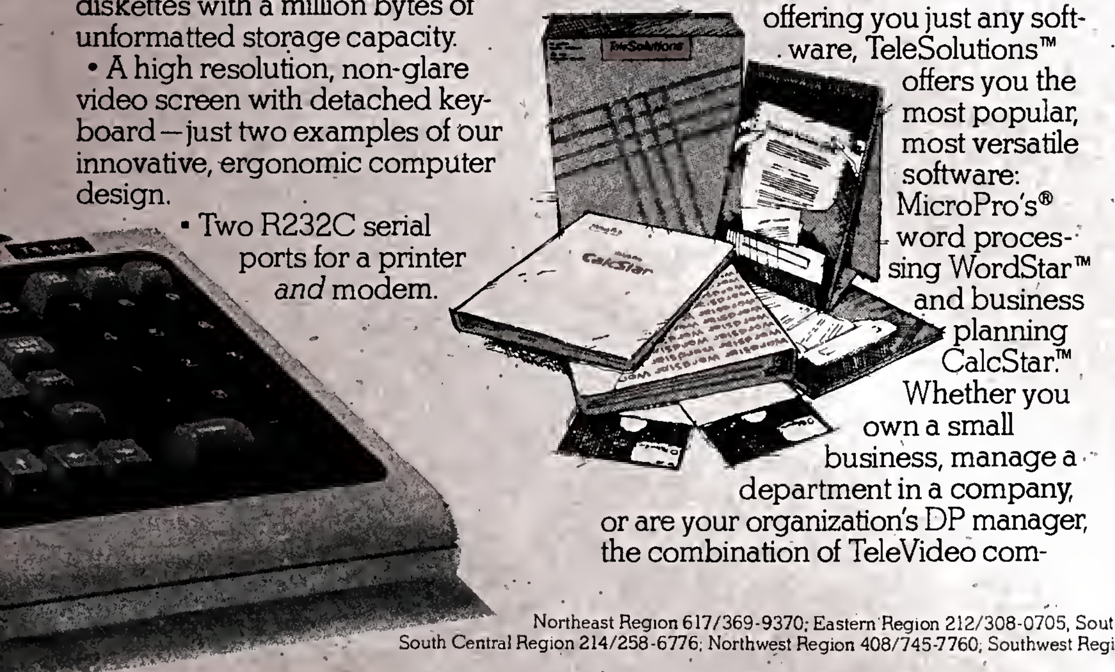

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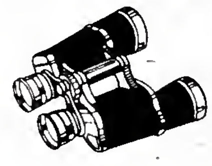

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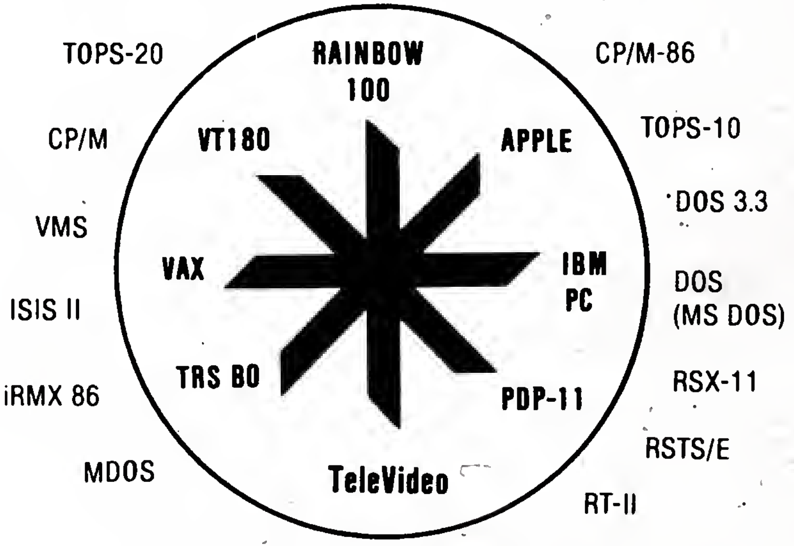

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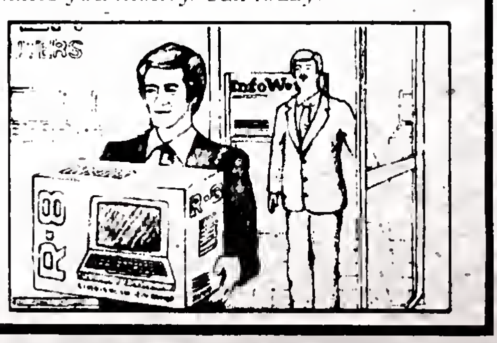

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The Newsweekly for Microcomputer Users
530 Lytton Ave., Palo Alto, CA 94301.

Random Notes

Credit, Collections Package Released for System/34, 38

WARWICK, R.I. — Daily & Wolcott, Inc. has announced a credit and collections package for users of IBM's System/34 and System/38. The package can be used with IBM's Mapics and Distribution Management Accounting System II, a spokesman said.

The program permits on-line updating of accounts. It also retains payment histories for inclusion in credit analysis. Credit managers can use the software to schedule account reviews and the package will provide a list of accounts for review each day, the vendor said.

The package costs $500 for a System/34 and $900 for a System/38. Daily & Wolcott is located at 120 Lavan St., Warwick, R.I. 02888.

Package Extends Capability Of IBM Mapics Program

DANVILLE, Calif. — A software package said to extend the capability of the IBM System/34 Mapics General Ledger program has been announced by Pat Locke Associates, Inc.

Journal+ provides a facility for the creation and maintenance of recurring journal entry sets, which can subsequently be selected to create one or more diskette journal entry batch for Mapics posting, a spokesman said.

The package provides for a maximum of 99 journal entry sets/company. Each set can contain up to 999 entries, each with a maximum of 99 debit and/or credit account lines, the vendor said.

Journal+ costs $495 from Suite 200, 181 Emmons Canyon Lane, Danville, Calif. 94526.

Graph/Histogram Module Introduced for System/34

ATLANTA — Data Management Systems, Inc. has announced an add-on bar graph/histogram module for the firm's Datascan information retrieval and reporting package for IBM System/34 and Datapoint Corp. processors.

Datascan users reportedly can use the package without having to modify files. Users have the option of using standardized bar, scaling and other report parameters or can define their own parameters, the vendor said.

The package costs $750 for use with the System/34 and ranges between $550 and $1,000 depending on the Datapoint hardware used. The package will be available to System/34 users Sept. 1 and will be offered to Datapoint users Oct. 1, according to a spokesman. The vendor is located at Suite 222, 4675 N. Shallowfield Road, Atlanta, Ga. 30338.

Spreadsheet Tool Added To Acuity Software Line

SAN DIEGO — Iris Systems Corp. has added to its Acuity line of financial software.

Designed for IBM's System/38, Digital Equipment Corp.'s VAX-11 as well as Harris Corp. and Prime Computer, Inc. processors, the package, called Labor/ODC, can be used to forecast people costs and other resources, a spokesman for the vendor reported.

Features include the ability to forecast overtime rates and other costs; the package can be linked to the user's project cost and revenue data base, the vendor said.

The package costs $5,000, the vendor said from Suite 320, 10150 Sorrento Valley Road, San Diego, Calif. 92121.

ISM Accounting System Announced for System/38

SAN DIEGO — A software product has been announced for users of IBM System/38 by Integrated Systems Management, Inc. (ISM).

The ISM Accounting Amortization System (IAAS/38) provides for standard loan amortizations, hard-copy and screen breakdowns by principal and interest over the life of a loan and a monthly payment comparison screen with incremental principal and interest figures, a spokesman said.

This product was written for the System/38 in RPG-II. All data files are externally defined and source programs are provided, according to the vendor. It also includes a training system that provides documentation continuously during program operation via the help key.

IAAS/38 costs $395, the vendor said from Suite 344, 2515 Camino Del Rio S., San Diego, Calif. 92108.

Utility Package Released; Supports IBM 5280 Systems

JEFFERSON CITY, Mo. — Software Systems, Inc. (SSI) has introduced a utility package that reportedly supports distributed processing on IBM 5280 distributed data systems communicating with System/38 hosts.

The System/38 Emulator Transfer Utility (ETU/38) is said to allow data transfer between physical files on the System/38 host and the 5280 diskette data sets. The package also allows the System/38 to allocate, delete or test a 5280 data set, the vendor said.

The ETU/38 works in conjunction with SSI's 5251 Emulator and 5280 Job Stream Supervisor.

The package is licensed to the System/38 and carries a $750 license fee. SSI is located at P.O. Box 1766, Jefferson City, Mo. 65102.

Package Out for Hospitals; Manages on System/34

BILLINGS, Mont. — A materials management package for hospitals running on IBM System/34 is available from Billings Deaconess Hospital here.

Among the features of the system are interactive processing of issues and periodic batch processing, automatic recalculation of patient-chargeable items carrying price increases, perpetual inventory of stock balances at multiple locations and inventory valuation by both average cost and last invoice cost, a vendor spokesman said.

The package costs $2,500 and includes RPG II source code, users manual and two days of training at Billings Hospital, located at Broadway at Ninth Ave. N., Billings, Mont. 59103.

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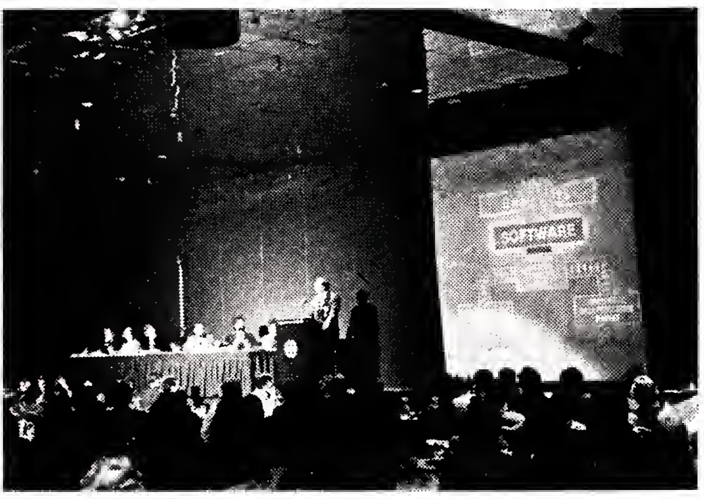

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Monday, Personal Computers in the Office
Dr. Harold Kinne, President & Founder, Halkin Computing Corp.
"The Future of Information Appliances"
Jean Yates, Gnostic Concepts
"Micro Operating Systems"
John Dvorak, Editor, *InfoWorld*
"New and Future Products"
Maggie Canon, Editor-In-Chief, *InfoWorld*,
Panel: "Personal Computers in the Office"
Howard Anderson, President, The Yankee Group
"The IBM Personal Computers: The Effects on the Industry"

Tuesday, DP Role in Office Automation
Amy Wohl, President, Advanced Office Concepts Corp.
"Achieving the Possible"
Patty Seybold, Editor, The Seybold Report
"Integration Issues in Office Automation"
Dr. John McQuillan, President, BBN Information Management
"OA Survivors Guide to Multivendor Environments"
Dr. Michael Zisman, President, Integrated Technologies Inc.
"Hardware & Software Bridges Between Systems"
Dr. Warren Briggs, Suffolk University
"Distributed Decision Support Systems"

Wednesday, In-Depth Communication Seminars
Dr. Dixon Doll, President, John King, James Doherty, DMW Group
"Strategy & Planning for Computer Branch Exchanges & Teleconferencing"
Thomas A. Hannagan, President, Hannagan & Associates
"Electronic Mail: Systems Selection and Implementation"
Dr. Michael Hammer, Associate Professor, MIT
"Formulating An OA Strategy and Plan"

Costs for the OA Forum are: Personal Computers in the Office (Sept. 13) $145; DP's Role in Office Automation (Sept. 14) $245; In-Depth Advanced Communications Seminar (Sept. 15) $295 (includes seminar materials and professional course instruction). A special three-day combo registration is only $595 which includes lunch daily.

To register, or for more information, call Louise Myerow, Registration Manager, **toll free 1-800-225-4698** (in Mass. call collect 617-879-0700).

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SPECIAL**REPORT**

Minicomputers And Small Business Systems: A Practical Primer

Edited by Tim Scannell

August 30, 1982

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Understand Information Needs Before Buying

By William Starnes
Special to CW‡

From the outside looking in, the path to computerizing a business looks relatively easy: Decide where you want to put the machine. Put it there. Plug it in.

Unfortunately, the acquisitions road is not that smooth — a fact that most neophyte users discover soon after signing on the dotted line. There seems to be a need for expertise in not only defining what is needed by a company, but for designing a system that will most closely meet those needs. This expertise seems to be lacking in both the information systems community and in the user community.

Most systems professionals have been confronted by users whose approach to design interaction is "you design what you think we need, and we'll tell you whether we think you are right." But, since few users and information systems people have a good grasp of the total information needs of a company, and how this information interrelates, systems design and development has historically been very segmented. The end result is a hodgepodge of little "minisystems," each doing the same thing, or systems that should have the options of doing the same thing, but do not.

Each of these little systems have been developed over the years as individual projects with too little recognition that an "entity" in a business is an "entity" whether it is a cut part, a molded component, a group of companies or a widget.

The fundamental types of information needed to allow any business to be managed and its objectives to be met are the same throughout all functional levels. In any business venture — even computers — the manager has to know what is planned, what actually occurs, what the variances are and what conditions cause plans and actions to vary. Changes and corrective actions can be made for these causes, reducing the possibility of unfavorable variances.

Technological advances may change the way we store and access information, the volume that can be stored and the speed at which it can be accessed and processed, but they are not going to change the fundamental categories of information that are needed. These categories include an objective measurement of what is desired and planned, an analysis of what actually happens and the measured variance between the two.

Building Selection Criterion

With these fundamentals in mind, the potential user can begin building a selection criterion. A total business system can be conceptualized first of all as a two-dimensional matrix. Along the horizontal axis is time. Time may be represented in increments of days, weeks, months or years.

Along the vertical axis are the entities to be planned, measured and dealt with in the company. Each entity on the vertical axis must be measured in terms of what is planned, what actually occurs and what the variance is.

The first rule to remember is that although different functional areas in the company deal with different sets of entities, they are all interrelated along the same time line. The objectives set at the highest corporate levels drive what is planned at the lower levels, and the achievements below usually affect what eventually occurs higher up the corporate ladder.

Each group in a company, although operating as a separate entity, must consider the purchase and use of the computer as an aid to the general good of the whole. To simplify adding a centralized system to a large corporation, each division must consider its individual needs, but have a final united objective in mind.

Upon examining any company structure, you can see that demand is usually pushed down through the entity matrix from top to bottom, results are pushed back from bottom to top and variance assessments are made all along the way.

Basically, it can be viewed as a naturally pulsating AM/FM wave with amplitude governed by the depth of entities and the frequency governed by the demand, results and timing.

The real gut-rending work of building a good system comes in the detail, design and specification of the beast. A necessary prerequisite to this labor, however, is a thorough understanding by information systems personnel and by user groups of just what information in total is needed.

Starnes is a free-lance writer.

Staffing, Approach Keys to Successful System

By William Starne
Special to CW‡

A successful business system, one that is effectively useful at all levels of a corporation, is based on two items that should be considered at the planning stage: staffing and approach.

Staffing is relatively simple. A project should have a strong project leader, and the acquisitions and implementation process should have representation from all areas of the firm that will be affected by the computer.

The hardest part lies in the approach. You cannot build an adequate system if you do not have a firm understanding of your operation and the problems that might occur along the way. To have an effective approach, the manager or project leaders should:

- Grasp the old environment, define the new environment and recognize the evolutionary impact of each on the information needs.
- Identify all the components, top down, of today's information systems.
- Recognize how and what information flows from top to bottom and back from bottom to top. Understand the frequency and content of flow, why it exists as it does and whether it might need changing.
- Poll all known problems from all functional areas and understand why they exist.
- Conceptualize what a new system should look like in terms of which entities are involved at the various functional levels, which high-level entities drive which low-level entities in the information downflow, which low-level entities feed and drive which high-level entities and the desired frequency of downflow and upflow.
- Begin to modularize — break the entities out into functional areas, defining carefully the expected input and output of each major module.
- Understand and define the deliverables necessary at each functional/modular level for proper management to occur.
- Precisely identify the data requirements necessary — past, present and future — to deliver the necessary information.
- Reexamine the information flow in terms of deliverables (frequency and content) and make necessary adjustments.
- Define storage requirements and the methodology for data.
- Make an assessment of the objective and subjective benefits of the new system.
- Identify development dependencies.
- Estimate the cost and timing of the new development.
- Present the findings to top management and get an interim "proceed" decision.
- Investigate software packages on the market and determine the availability of the ones that fit your needs.
- Formulate a develop-or-buy recommendation.
- Make a final presentation to top management, and get a "go" or "no go" decision.

Inside

User Can Add Functions, Value To Core System 3

Shopping for a Micro-Based System? Look for S-100/IEEE 696 Standard 4

Flourishing Micros Offer Real Advantages 6

Merging WP, DP Operations Can Be Beneficial 7

Institute Comes Up With 'Idea' For the '80s 9

Multiservice Application System Not Easy to Implement 11

Mini's Enemies: If It's Not Heat, It's Humidity 12

Beware of Overemphasizing Benchmarks 14

Vendor Variations Noted For Changing Benchmarks 16

Cash-Poor Museum Hustles Gratis DP System 17

Get Promises on Paper Before Buying System 21

County System Battles Pinch of Lower Taxes 24

Service Bureau Data Base Solves Insurer's Ills 25

Service Bureau Minis Aid Medical Practices 26

Distributed Minis Steer Motor Vehicle Division 28

Mini-Based Net Makes Work Play at Toy Firm 30

Self-Analysis Key to Small Business Computing 33

Preparation Steps Outlined

User Can Add Functions, Value to Core System

By Fred Fredrickson
Special to CW‡

Today's information processing marketplace is being fueled by user demand for easy-to-use, multifunctional systems as well as by vendor-driven production of word, data and video processing designed to be linked by various types of communications equipment.

However, no such single system exists today and no one organization is ready to install all of these components. Rather, users are looking to install one or two core systems and, eventually, to add function and value to the systems.

To prepare for this situation, users should take the following steps:

- Understand the functional goals of the organization.
- Focus on support of entire organizational and departmental procedures.
- Consider managerial productivity enhancement.
- Implement an organizationwide communications network.

Access to Information

Not everyone in an office needs access to all information and, naturally, it is less expensive to supply each worker with a level of equipment that does not exceed his needs. As a result, a multilevel information processing architecture has evolved in medium to large-size businesses.

Computers have been employed to perform word and text processing since the early '70s. The introduction of stand-alone single-function word processors paralleled the introduction of single-function DP systems in the '60s.

Cost and user needs dictated that shared logic configurations be offered, and these systems have led to distributed, multiuser shared-resource systems with a large number of terminals installed in those same departments utilizing data terminals.

Major Enhancement

A major enhancement to these systems has been the advent of a communications capability, permitting point-to-point transfer of documents over telephone lines or message networks. Even the new low-cost "writers" will be able to communicate to nodal and host processors through sophisticated communications protocol emulation.

Each workstation becomes the primary personal appliance for the knowledge worker, providing him with DP, WP, communications and personal support functions.

From a technical viewpoint, individual products offered to date often lack adequate power, capacity and extensibility for many integrated applications.

Most important, the lack of a total communications concept for integration of the many disciplines in future office systems is the limiting factor. It is the key issue in developing the integrated system of the future.

DP and WP systems are clearly the major tools utilized for improving organizational productivity, but communications is the thread that holds the entire office automation tapestry together. Fundamentally, communications provides connectivity for all user applications regardless of the location or the language of the receiving user.

Local-Area Nets

Local-area networks provide the key to efficient interoffice communications. The list of local networking applications is long and varied, containing terminal-to-host communications; host-to-host communications; shared-access to special-purpose devices (data base machines, graphics systems and so on); environment control; communicating word processing; electronic mail; teleconferencing; voice communications; and document facsimile.

Industry experts agree local networks will take as many forms as users require. Because of the diversity of user needs, it is probable that no single product can hope to dominate the market. Thus, many manufacturers will produce local networks capable of handling high-speed devices and equipped with sophisticated operating systems, inexpensive mass storage and high-performance communications facilities.

There is no secret that the communications needs of most companies are expanding rapidly. A network that solves today's problems may in a year or so be incompatible with those needs.

Optical fiber promises to be a major supplement to both twisted-pair and coaxial-cable networks in the '80s. Twisted pairs of wires — the still-dominant medium for data transmission — may pose installation and maintenance problems for many network managers charged with making increasingly complex communications systems run smoothly. As major corporations find more and more applications for data communications, network managers will continue to face the difficulty of interconnecting their private networks cost-effectively.

In the Forefront

Networks using satellite earth stations are now on the forefront of data communications technology. Because communications satellites transmit and receive over large geographic areas, they are ideal for interconnecting future integrated office systems on a national or worldwide basis.

The satellite replaces microwave or terrestial cable, usually resulting in superior service at a lower cost.

System design must provide a broad highway for communicating information between multifunction user terminals and processing devices in order to eliminate delays and make it possible to integrate word, data and voice processing functions. As teleconferencing becomes economically viable, this highway should also carry the video signals to any user station.

Integrated system architecture is based upon a broadband local-area network within the customer's buildings. Such networks can transport voice, video, text and data. If video information is not required, the network can be simplified to operate in a baseband mode. Direct communication between attached devices eliminates the need for a centralized supercontroller, enhances system throughput and provides a great deal of flexibility when these systems are installed in new or existing buildings.

Cost-Effective

The private branch exchange (PBX) is very cost-effective for switching telephone traffic and lower speed digital devices such as casual user terminals, providing them access to WP and DP files. The PBX also acts as a gateway between the local network and the public switched network for voice and low-speed data transfer to other plants.

While dedicated lines or the public switched network will be used for a great deal of interplant communication, particularly to smaller sites, a significant increase in utilization of private networks can be anticipated. The goal of all these networks is to utilize the communications channel to its maximum efficiency, providing high-speed, reliable information transfer.

Fredrickson is vice-president of technology for the Information Systems Group at Harris Corp.

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Shopping for a Micro-Based System? Look for

By **Mark Garetz**
Special to CW‡

Selecting a microcomputer or microcomputer-based business system today is no easy task. There are literally hundreds of systems to choose from, each one offering its own particular software or hardware benefits.

However, for all its present strengths, the microcomputer actually grew from humble beginnings. The market was started from a magazine article that gave details on how to construct a small machine called the Altair, manufactured by Micro Instrumentation and Telemetry Systems (Mits), now defunct.

This computer (Altair) was based on an Intel Corp. 8080 microprocessor and consisted of a case, front panel and circuit cards, interconnected by a motherboard that had 100 pins. It sold for abut $395 and had 256 bytes of memory.

Some enterprising individuals decided that there was a need for more add-on circuit cards for the Altair, such as higher density memory boards, color graphics boards, I/O boards and more. Many small companies then began to make boards for the "Altair Bus." A company named IMS Associates, Inc. (Imsai) then decided that they could build a system better than did Mits. The Imsai 8080 caught on quite well and the bus became the "Altair-Imsai Bus."

More companies jumped into the market and each attempted to add their name to the name of the bus, thus phrases like "Altair-Imsai-Cromemco-Polymorphic-Processor Technology Bus" were not uncommon. Something had to be done.

S-100 Bus Named

Also, at that time, Roger Melen, cofounder of Cromemco, Inc., came up with the idea of calling the bus the "S-100 Bus" — S for standard and 100 for the number of pins. The name caught on and remains today.

The functions of the various pins on the S-100 bus were more or less standardized, but incompatibility between various manufacturers' products plagued the industry. Two designers, George Morrow and Howard Fullmer, decided to draft a standard document that would specify the exact function of each signal line as well as its timing specifications. The purpose was to get the Institute of Electrical and Electronics Engineers (IEEE) to adopt the proposal as a standard. Meanwhile, several enhancements were added, including the capability to handle 16-bit CPUs, multiple CPUs and up to 16M bytes of memory.

The IEEE liked the idea and a committee was formed, which assigned the task number 696 to the S-100 standard, and the proposal was first published in the July 1979 issue of *IEEE Computer Magazine*. Today, the standard is still not quite official, but it is very close. As of this writing, the standard has been passed through two levels of committees in the IEEE and has two more to go. Final approval of the standard is expected in November.

The advice to potential users looking to purchase an S-100 system may seem obvious: look for the phrase "S-100/IEEE 696-compatible" or "fully conforms to the S-100/IEEE 696 standard." This may not be a true indication of a product's merit, but at least it is a place to start.

Be aware that some manufacturers may make claims about IEEE compatibility, but there may be some deviations from the standard that are not obvious, that are not mentioned in an ad or about which the manufacturer or his representative for supporting documentation (such as timing diagrams) did not

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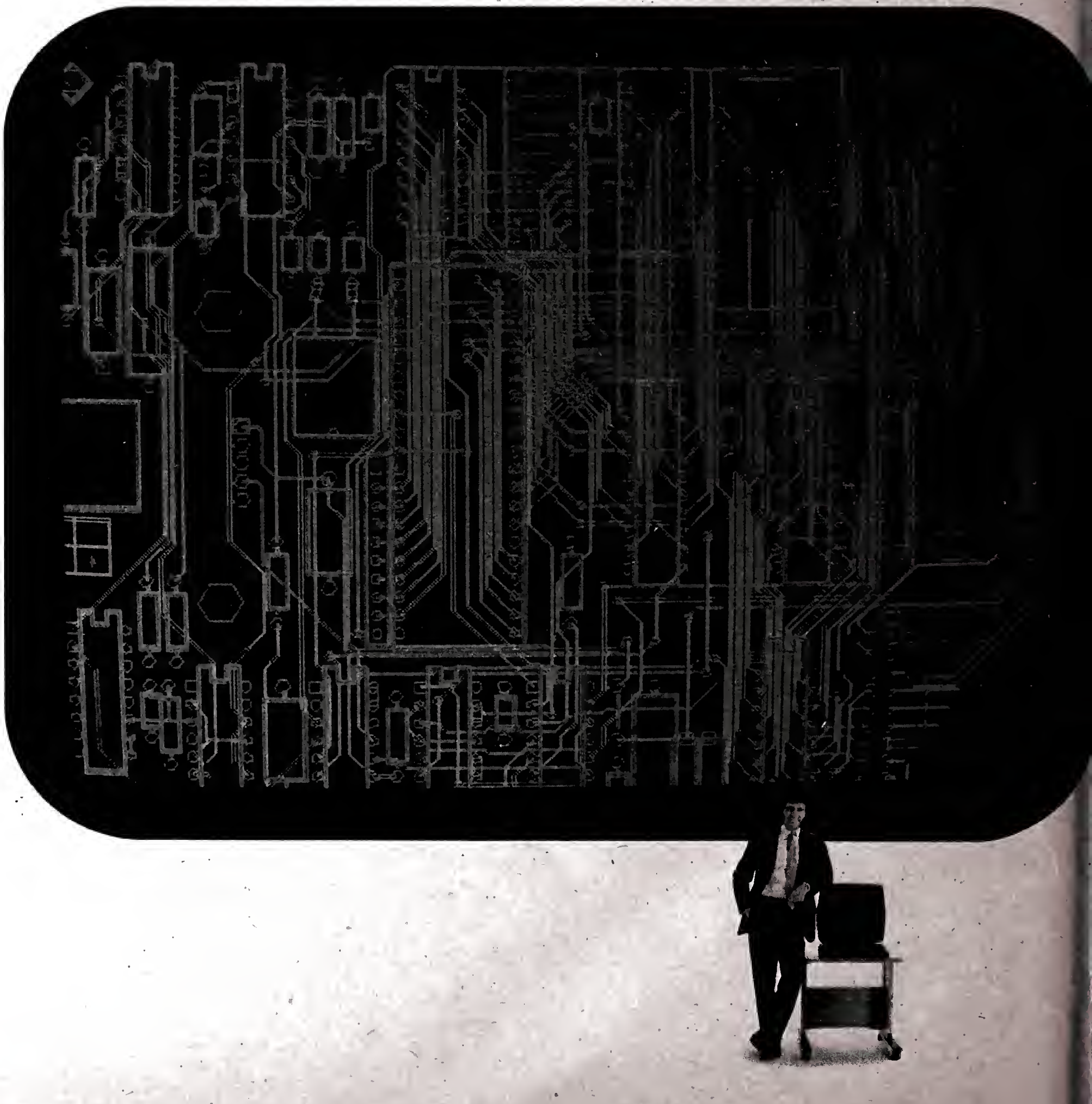

S-100/IEEE 696 Standard for Starters

include information.

In addition to the above general comment, here are some other guidelines:

- If at all possible, avoid buying products direct from manufacturers. Buy instead from a local dealer or systems house. Generally, manufacturers can not provide adequate support and the "hand-holding" usually necessary when bringing up a system.
- Do not be afraid to check out local dealers or systems houses thoroughly. Ask to visit some of their previous customers who have bought systems similar in capabilities to the one under consideration. Ask those customers questions such as how they like the systems, how easy they are to use and, most importantly, if they perform as advertised.
- If there is no local dealer (or one who is only interested in selling Apple Computer, Inc. products), look around for an independent consultant to help put the system together. Perhaps the Apple dealer knows someone. Local computer clubs are a good place to find help, and even a classified ad in the local newspaper might work. Again, check any consultant's references very carefully.
- Make sure the system can be easily upgraded to accommodate future computing needs. Can a 16-bit CPU be added at a later date? Can more users be added? More mass storage? More memory? These are important questions because the main advantage of buying an S-100 system is the capability to upgrade and change the system when the user's needs change.
- Remember that you always get what you pay for. The most expensive system may be overpriced, but the least expensive "bargain" system may cost a lot more in the long run.
- Compare warranties: Does the manufacturer or dealer offer a substantial warranty? Is a maintenance contract available? Is there a one-day (or same-day) board replacement program? When a computer goes down, it can cost you a lot.
- Make sure to pay for all software. Don't fall for the trick of a dealer saying "Oh, I'll throw in any software you want." He is probably stealing the software by offering bootleg copies of programs he owns.

This is unethical and illegal. It hurts users in the long-run because software houses will not be able to stay in business. It may even hurt the user in the short-run because he will not get any support from the software house if there is a bug or other problem. Make sure to get a valid user agreement or license for all software purchased or provided.

- Make sure that the dealer or systems house has the capability to make custom modifications to any "canned" applications packages and be prepared to pay for this service. Don't believe that they will fit a specific application "right off the diskette."
- Users new to computers, or even those upgrading from an Apple, Radio Shack TRS-80 or other small machine, should not believe that standard incompatibility problems still exist. Get some professional help.
- Make sure the system is well documented, and get owner's manuals for all the parts of the system. They may never be needed, but if the dealer that sold the system goes out of business and the system ever goes down, the technician that fixes it will be ever grateful (and it will most likely cost a lot less). Also, make sure the user's manual for the system is professionally done.

Garetz is president of Compupro, Inc. based in San Leadro, Calif.

or 1/5000th of it.

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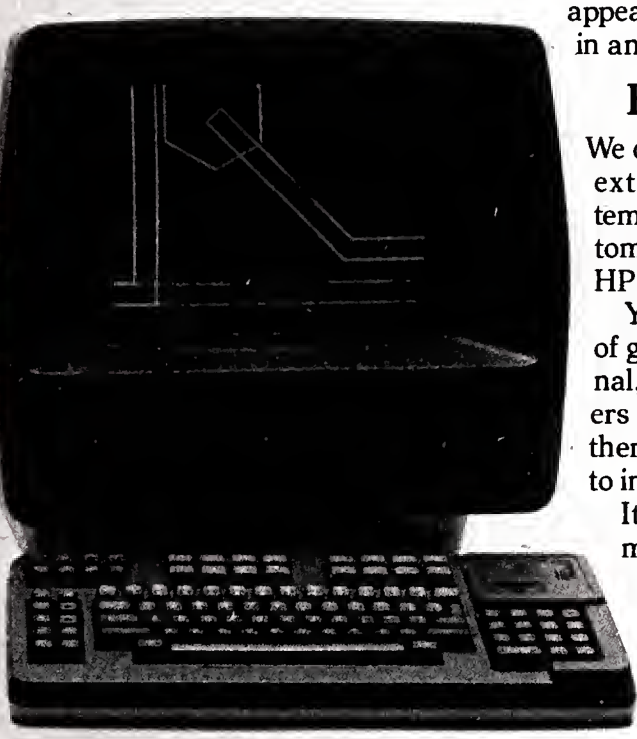

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We designed the HP 2700 to be extremely adaptable for systems. In fact, we'll help you customize it with a wide variety of HP peripherals and interfaces.

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Its tremendous local power makes the HP 2700 ideal as a graphics system terminal. You can call up data, display it graphically, manipulate it, then send it back to the CPU.

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Flourishing Micros Offer Real Advantages

Special to CW

Corporate data processing has survived many technological revolutions in its short career, but now faces a powerful new force that it cannot defeat. Micros have invaded the corporate data processing empire and are winning the war.

It is a much different war from the one corporate DP is accustomed to waging. The battle is not being fought in the traditional stronghold of data processing — the high-budget arena of mainframe computers and expensive systems and programming staff.

The war is being fought in the day-to-day work environment where things are done cheaply and quickly. Your users are being won over by the local presence of "grass roots" computing power that responds quickly to their unique needs.

More Active

Micros are becoming more active in the user community, while the Information Services Department is being drowned by such things as bureaucracy, mainframe technology and dinosaur systems that have evolved over the past 20 years.

If DP is to survive, you must learn to adopt the tactics of this new war.

You must learn to utilize the micros and apply them to the needs of your users at user locations. This cannot be done from within the walls of your computer room.

Advantages of Micros

Micros offer very real advantages that can be used effectively by a savvy DP manager. For instance:

- Micro solutions are generally quicker and cheaper to implement than mainframe solutions. The hardware can be acquired for less than $4,000 — an expense item in some budgets and four to five times less than most mainframe peripherals.

Most importantly, it is cheap enough to be acquired by user departments and justified by a single application. No lengthy appropriation process is necessary.

Second, the hardware is available immediately through local outlets. There is no need to endure three- to four-month vendor delays.

Third, many packaged software solutions are available immediately at very little expense. There is seldom a need to become involved with complex operating system software, data base managers, teleprocessing monitors, Job Control Language, existing systems and a vast array of mainframe hardware.

- Micros are simple to install and use. No special wiring or air conditioning is needed, and microcomputers do not require trained operators. School children can operate and program them.

Most of the commercially available software is no harder to learn than Mattel's Intellivision golf.

- Micros give users total control. The data, hardware and software are completely controlled by the owner. His data is available when he wants it, and its content is completely de-

(Continued on Page SR/8)

Many Uses Found for Microcomputers

Special to CW

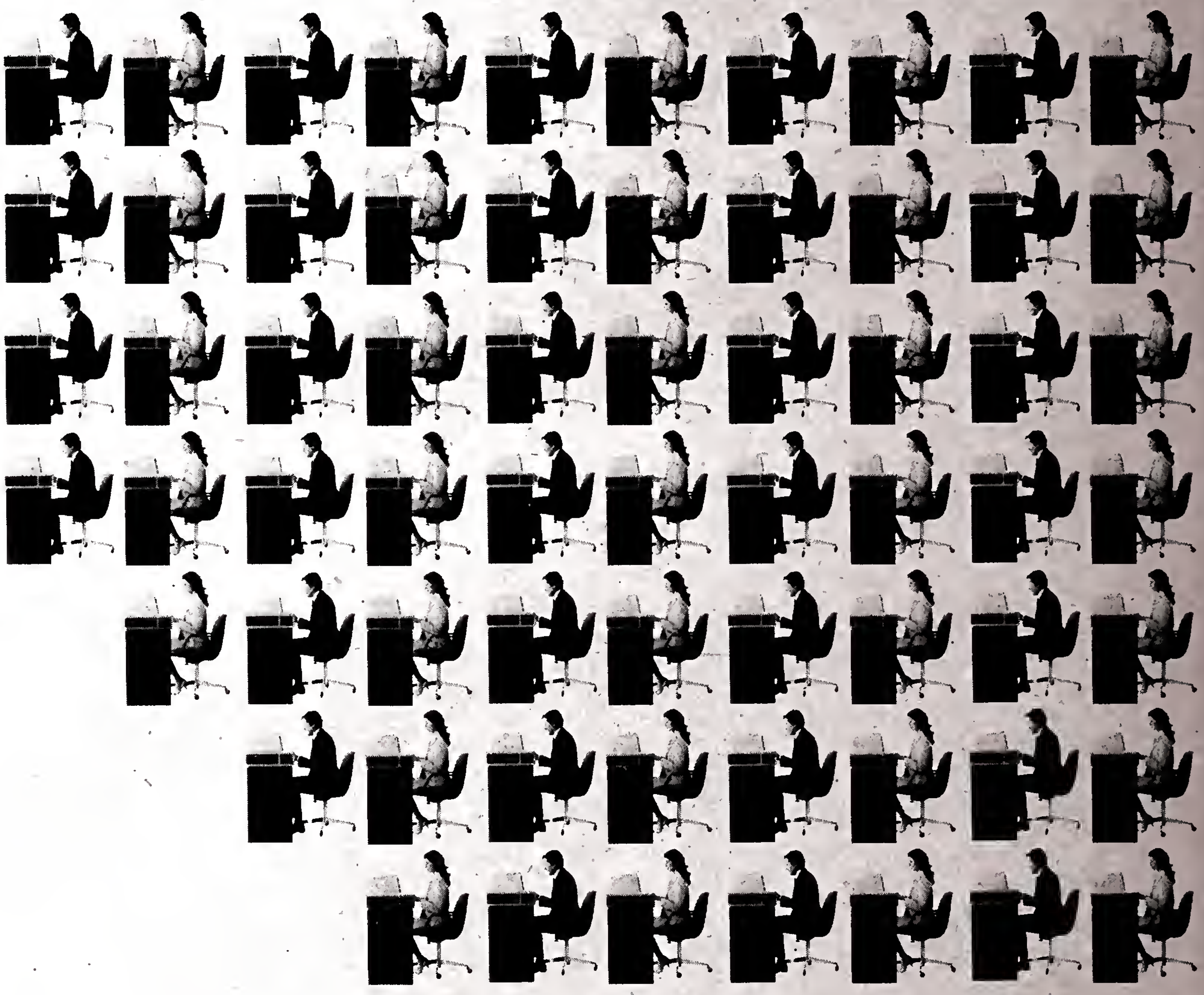
Microcomputers can be used not only as executive workstations, intelligent terminals and windows to the company's mainframe, but also to tailor software for larger machines.

For the price of most time-sharing terminals, a programmer can have a dedicated software development tool guaranteed to be compatible with the target machine. Debug capabilities on micros are approaching mainframe capabilities. Turnaround for the programmer is improved. The CPU is dedicated to him and he has his own printer.

His time-sharing response is not degraded by other users, and his printed output does not get stuck behind those extremely large, high-priority production reruns. Mastering the complexities of mainframe operating systems, utilities, development tools and so on takes extensive training. Application software development on micros is much less complex.

Use micros to develop prototypes for more extensive follow-on systems. For example, create a simple prototype of your branch inventory system using micros. Work with a few branches to see what they do and don't like. Change the software, and iterate this process until you have a good idea of what the system should do.

The advantages of this approach are that it is quick and cheap. The user does not have to wait 18 months to find out he doesn't like the system and then be powerless to change it.



Multifunctionality Saves Time, Energy

Merging WP, DP Operations Can Be Beneficial

By Clifford Chirls
Special to CW‡

Although users have begun to merge data processing and word processing into the same departments, most firms have traditionally considered them to be separate and distinct functions. As a result, even though both departments are considered to be under the same "information processing" umbrella, the organizational responsibility is split between two factions.

While companies should not necessarily change their organizational structure merely because technology has changed, benefits can be gained by taking advantage of WP in the DP department and DP on the WP side of the fold.

As any DP executive will tell you, program documentation is a primary concern. It is also one of the most detested tasks in the DP world. However, though not a panacea, WP can make this tedious chore less time-consuming and more easily performed, especially since the WP can be done on the same CRT terminal used to process data.

Consider Company A, a large mainframe Cobol DP department in a Fortune 500 manufacturing firm. Its program development backlog was 12 to 18 months. The challenges it faced were long screen response times, high mainframe operational costs, idle programmers waiting for mainframe availability and incomplete documentation. The company needed a system to offload program development and extend the life of its mainframe computer, provide greater availability and provide WP to programmers so they would find it easier to document their efforts.

How many marketing or financial executives have asked why they can't easily access the data on the company's mainframe computer and have the customer and financial information merged into those quality documents produced by the WP department? Why do they first have to ask for a computer run to get a report on all customers who satisfy certain criteria, then request the data on those customers and then provide a list to the WP department for inclusion in boiler plate letters? They don't. Data processing for the WP department is the answer.

Consider Company B, a medium-size property and casualty insurance company with extensive WP requirements that is mainly concerned with producing policies, letters and memos. The firm needed a system capable of taking information from its customer master file on its mainframe computer and, following a selection process, merge that customer information into boiler plate letters so that policy issuance, policy expiration letters and other marketing letters would be totally automated and more cost-effective.

Multifunctionality

Company A utilized the benefits of WP to solve its documentation needs. Management did not integrate the two functions in the informational sense of programs physically including WP text or vice versa. At various points in the program, however, notes were written indicating that the programmer had stopped momentarily to access a WP document and write some explanatory text. Company B received the benefits of informational as well as functional integration by taking data files containing the names and addresses of policyholders and pulling them from the mainframe to the minicomputers where they were merged into policies or letters.

This multifunctionality, which can be provided at the same terminal or simultaneously at multiple terminals and the integration of information across data and word processing functions gives a company the ability to satisfy the different needs of both its DP and WP departments. Because the WP supervisor can make a selection on data processing files and automatically merge that information into boiler plate documents, his typists do not have to key that information into a separate and consequently redundant list that would have to exist for a similar application on a dedicated WP machine.

Thus, although companies may organize their information processing along functional lines, gains can be made from the new technology that merges data processing and WP. The DP and WP departments can benefit from each other's previously exclusive function and expertise.

Chirls is an account executive with Wang Laboratories, Inc.'s Hartford, Conn., office. Before joining Wang, he was an IBM marketing representative.

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Flourishing Micros Offer Real Advantages

(Continued from Page SR/6)

termined by him. The hardware is available when he wants it. It is not tied up by rigid schedules beyond his control.

Finally, the software is under his control. He can fix it by himself immediately, without filling out a project request justifying the programming cost or waiting until his request rises to the top of the priority list.

• Micro workstations are multifunctional. Purchasers of micros soon discover that many tasks can be addressed by the hardware.

The micro can act as a terminal providing access to corporate mainframes:

It can inquire into mainframe data bases, serve as an input device for transaction processing, collect transactions locally for later transmission to a host or receive data from the host and store it for later manipulation or display.

Microcomputer Weaknesses

The micro does have some weaknesses:

• Implementation requires effort. While the micro is easier to use than a mainframe, it is still much more complex than other tools with which users normally work in their offices.

It takes time to learn how to use a microcomputer, and hardware and software malfunctions will occur.

Users soon realize that commercially available software is never completely "turnkey." There are almost always "minor" software modifications that would be nice to have.

• Micro technology is advancing so rapidly that in a few years, today's micro will be obsolete. New software will not run on the old micro, and old software will not run on the new models. Users must then choose between stagnation with their present configurations or the purchase of new hardware.

• Data storage and processing power is limited, so there is a limited set of applications appropriate for today's micros.

Users eventually will want to process large corporate DP files through complex systems. These requirements will tax the resources of most micros.

There is no free lunch: Extensive use of micros by a user department will eventually demand full-time resource commitments. Large user departments may form their own micro staffs; small departments may pool resources to form a centralized micro staff.

Armed with an appreciation of the strengths and weaknesses of microcomputers, you can begin to counterattack. The first maneuver is to begin utilizing micros in your own shop — develop a familiarity with them and exploit their capabilities.

• Search for likely applications of the technology. Take advantage of the low cost and quick implementation capabilities to help reduce backlogs. That new on-line order entry system that has been promised for years might be implemented in months on a micro.

• What about that on-line inquiry system for which users have been clamoring?

If the volume of data needed is not large, consider loading and providing access to it from a micro using one of the easy-to-use micro data base management system packages. If the data can be fragmented by the user, it could be spread over several micros.

• Give your users something new — like graphics. Graphics packages abound on the micros, and they are not difficult to interface with mainframe data.

Many managers already graph key data they receive from DP so that they can understand it and recognize trends. Why not do this for them?

• Expand management's use of local computing power. DP has been talking for years about putting terminals on managers' desks, but so far has had little success.

Look around your organization. You will probably find more micros being used by managers than terminals implanted by DP.

• Give your programmers a chance to use micros in their own assignments. The world of micros also provides an exciting, new area of investigation for your staff. Many of your people are probably deep into micro technology already.

Programmers love to investigate new technological areas and become active participants in leading-edge concepts. They would certainly enjoy a break from maintenance.

Helping Agent

There are a number of actions that DP can take to become a helping agent instead of an obstacle. First of all, develop an expertise that other departments can call upon without charge.

Assist your users in sorting out the competing claims of hardware vendors, software packages, communications options and so on and gain their trust. Dedicate someone to learn the hardware, operating systems, application packages and acquisition techniques.

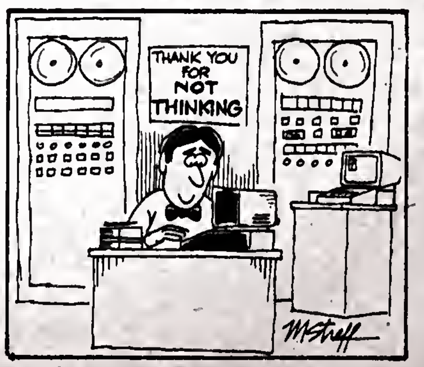
Users do not really want to become experts in these areas. Nor do they want to delve into technical problems. It is easier to let DP do that. If you can offer something of value — helpful expertise — it will be used.

In the micro world, DP neither owns the hardware nor controls the application. It just advises. This will require some adjustment to traditional DP thinking to overcome the fear of free users who are now able to make a few technological decisions for themselves.

Have a well-thought-out strategy for recommending certain hardware, communications options and so on, and explain why it is advantageous to comply with that strategy.

Suggest standardizing certain hardware. Arrange special pricing for that hardware with the vendor.

Offer hardware backup facilities. Users want the assurance that they are making the right decision.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Plan Provides Comprehensive Services

Institute Comes Up With 'Idea' for the '80s

MONTERREY, Mexico — In 1975, Monterrey Institute of Technology outgrew its mainframe. As a solution to its problems, the university simply switched mainframes.

When the institute replaced its Control Data Corp. CDC-3300 machine with a new IBM 370/158 computer, everything seemed to be secure. Two years later, however, university staff began planning for a new generation of computer resources.

Unfortunately, no simple upgrade path presented itself. Rapid technological innovations in computing and the industry's increased use of distributed systems made the school's exact future needs unclear. Furthermore, the cost of the different systems proposed as solutions varied widely.

The only thing that seemed obvious to the administration and faculty alike was that short-term solutions were to be avoided.

Planning Process

The planning and evaluation process, led by Dr. Fernando Jaimes, associate director of informatics at the university, lasted three years. Together with Patricio Lopez, then director of technical systems support, and Ramiro Flores, director of computer operations, Jaimes developed Informatica Distribuida para la Ensenanza y la Administracion (Idea), or Distributed Information Resources for Education and Administration, a plan to provide comprehensive academic computer services and an evolving spectrum of administrative services through the '80s.

The institute is Mexico's finest technical university. Founded in 1943 in the country's principal industrial city, its charter from the outset has been to train superior engineers who will participate in the country's industrial and technical growth.

The institute maintains 25 branches, serving 14,400 college students in engineering, business administration, agriculture and social sciences, as well as 2000 graduate students and 16,400 secondary school students in the higher grades.

Led by computer center faculty, the school explored the boundaries of its problems. First of all, students needed more contact with computers than a batch-processing environment provided. Students also needed exposure to a growing number of programming languages, operating systems and application programs.

The staff had made the IBM system as responsive as possible, using a "cafeteria" approach. Students submitted their program decks to a card reader and walked through to pick up their jobs at a printer at the other end of the line. Understandably, this approach began to seem rather dated with the advent of time-sharing terminals and minicomputers.

Time-Sharing Terminals

As a first step in planning for expansion, the staff explored time-sharing terminals. Several usage modes were available:

- Editing, compiling and running on a time-sharing mainframe.
- Editing and compiling on a time-sharing minicomputer and running on a mainframe.
- Editing, compiling and running on a time-sharing mini.

All three modes were im-

(Continued on SR/10)

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School Gets an 'Idea' to Provide Full Services

(Continued from SR 9)

plemented on a test basis, exercised thoroughly through load simulation by another computer connected to terminal ports of the service computer and costed out. The staff explored various configurations and operating systems over a period of two years.

However, all three methods were prohibitively expensive when compared with batch processing. Jaimes had set a medium-range goal of one interactive unit per 50 students and a long-range goal of one unit per 25. None of the systems could provide that number of service units at an affordable price.

It was at this time the university decided to investigate the use of microcomputers.

A staff member at the institute since 1964, except for a brief stint to complete his doctoral work at Purdue University, Jaimes has been involved in the school's computer planning from the beginning. During the late '70s, he evolved with Flores and Lopez a plan to build a large-scale, sophisticated processing system around microcomputers and mainframes linked together to serve the full spectrum of the school's needs.

Yet, basing long-term plans on such a vision represented, at the time, a substantial risk. Success required that microcomputer companies survive and grow.

Enter the Microcomputer

The computer center acquired its first micro in the late '70s. Micros from Radio Shack, Apple Computer, Inc., Commodore Business Machines, Inc. and others were exercised and evaluated. The staff tested the efficiency of their facilities for local execution, networking and communications. At the time, Apple seemed to be one of the strongest machines, especially for editing, with a good potential for growth.

Jaimes based his long-range plans on the following:

- Standardization of workstations.
- Workstation intercommunications.
- Linkage to mainframes.
- System modularity.

Standardization would ease maintenance, allow cost savings and minimize the problems in linking workstations with mainframes. Some machine features and operating systems would be lost by such an approach, but the losses would be offset by the usefulness of modularization in managing hundreds of workstation machines.

Jaimes had seen a local-area network demonstration at a National Computer Conference. The network, Nestar Systems, Inc.'s Cluster/One, could be used to link the school's Apples together. At the time, the Cluster/One was the only such network available. He acquired several of the networks for test and experimentation. Out of this came the integrated computer-usage plan known subsequently as Idea. The plan's central goal was to exploit the school's new computer resources to the maximum, at each stage in system growth.

Within a year of the adoption of Idea, 160 microcomputers had been purchased and installed at the Monterrey campus in standard workstation configurations for use by the students. Another 40 were acquired for various academic purposes, under the control of different departments. Thirty more were used for developmental work. Networks linking academic and developmental subsets of the computers were installed later.

Workstation Configurations

Each workstation included 64K bytes of random-access memory, two local mini disk drives, a display monitor and, for those on a network, a network interface card. Workstations ran under the Apple DOS Basic and Pascal operating systems; later upgrades included a language card enabling students to execute Cobol programs locally, under Digital Research, Inc.'s CP/M.

The institute's second-largest campus, at Queretaro, acquired 35 microcomputers. The Estado de Mexico campus bought 25. Eighty percent of the university's campuses now use microcomputer workstations, with seven also maintaining Hewlett-Packard Co. HP 3000 minicomputers.

Since the institute is dedicated to state-of-the-art training in a fast-growing field, it decided to implement its plans in stages.

In stage one, microcomputers edited, compiled, debugged and executed most Pascal programs. If a program was too large to fit the micro, it was sent to the IBM 370/158 for processing. Hence, an intermediate step to full mainframe/microcomputer linkage, the school's key-punch/card-reader "cafeteria" approach to mainframe batch processing, was replaced by a division of processing duties between micros and mainframes.

Student programs in languages other than Pascal could be edited at their

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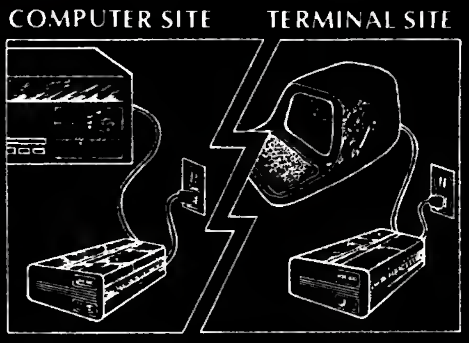

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Multiservice Application System Not Easy to Implement

MONTERREY, Mexico — An application system that provides data base services, sharing of peripherals and multiple interactive functions is by no means trivial to implement. On a microcomputer network, function is modularized. Software tasks can be divided and performed by different CPUs.

For this reason, the software can be written in small independent blocks. Students and faculty can work together on the project, doing a piece at a time. Pages of interlocking code must be avoided.

The prerequisite for success is a deep understanding of the concepts of network server and user stations. Such an understanding, which Dr. Fernando Jaimes, associate director of informatics at Monterrey Institute of Technology, and his associates have demonstrated from the beginning, is essential to the design of efficiently integrated code that fully exploits network capabilities.

Aids Student Registration

The special configuration of workstations and servers in the Monterrey Institute of Technology registration system was designed to enhance the student's ability to enroll in the classes of his choice, at the times of his choice, with the teachers of his choice, generally smoothing the registration process.

From the beginning, a complete preliminary system design process was carried out, including the evaluation of student/proctor transaction rates, data base sizes and server buffering requirements.

The system was first simulated and tested using only a few machines. Stations were added as work progressed. Nets were interlinked with the development of registration gateways. Traffic flow and system reliability were evaluated.

The system then was used to serve two graduate school registrations, with satisfactory results. Further testing of the system is scheduled, with large numbers of workstations added, before the system is put into operation in its full 200-server configuration, scheduled for January.

---

workstations, with the finished product stored on a minidiskette. Dedicated microcomputers with software developed in-house send and receive files as a means of communicating with the IBM 370/158, so that programs and results can be offloaded to paper or back to diskette.

Each of the school's workstations operate according to the software executing in it. Some stations run student application programs and are employed as multifunction workstations. Others at power-on automatically execute programs, which cause the machines to perform some specialized service for the workstations and other servers on the network.

In the case of Monterrey's registration system, faculty and students have written software that causes 10 of the network computers to act as printer-servers. Each printer-server controls one or more printers, expanding and printing schedules and registration-confirmation forms. Programs have also been written to allow stations to act as buffered, packet-switching gateways. These gateways interlink the registration networks. Other workstations act as data base, financial-record and monitor servers. The system is flexible enough to allow any server to be connected to any network and to handle requests from all stations on all networks.

In addition to four proctor/student networks, the registration system utilizes a control network. Here, a data base server keeps track of the number of students registered in each section of each course. A control workstation monitors the tables and adds, deletes or reschedules class sections as needed. Sections are closed when they fill up and new sections are added when demand for a particular course is heavy.

The system is transaction-intensive, representing an airline reservations network.

All the registration servers use network communications subroutines to accept and buffer incoming messages from proctor workstations; one or more messages can thus wait in queue until a server is ready to handle them. Any station on any network can communicate with any control station in the system and any server can reside in any network. Gateways route all messages to the appropriate destination.

Finally, with registration complete, the entire system can be dismantled and reconfigured for student use.

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Mini's Enemies: If It's Not Heat, It's Humidity

By Hans F. Levy
Special to CW‡

A minicomputer's two most dangerous enemies are something you can't see and usually do not realize are there until the damage is done. They are heat and humidity, two factors that can drastically influence a computer's output and weigh heavily on system uptime.

Small-systems vendors often make the statement that their minicomputers will operate properly in "standard" office or work environments. Unfortunately most of these vendors fail to note that these environments can undergo dramatic temperature and humidity changes when a typical minicomputer is added to the scene.

For instance, a standard 3 kW minicomputer generates about 10,236 BTUs of heat per hour, the same level of heat produced by 30 100W light bulbs that have been placed in a small box the size of a computer's cabinet. When placed in an office environment, this heat box can alter the environment's heat and humidity levels.

To complicate matters even more, office environments generally are not closely controlled and the central heating/cooling systems are usually turned down considerably or off during nights, weekends and holidays. And the minicomputers are not alone in their battle against a cool environment. Printers, CRT terminals and disk drives are all adding to the heat and humidity battle.

Just like users of bigger mainframes, minicomputer users have found that the optimum operating temperature and humidity levels for these smaller machines is 72° to 75° F at a 50% relative humidity level. Unfortunately, most typical environments do not meet these criteria. As a result, a computer's output may be garbled. Even worse, the life span of the machine may be shortened by a hostile environment.

While humidity is a very real problem, it is often the most elusive and the last to be identified as the culprit. In fact, in most cases it usually takes four or five service calls before the environment is spotlighted as the trouble or before the user realizes that problems lie in the office and not in the machine. And solutions to the problem can be even more slippery. While there are many answers, there are even more apparent solutions that fail.

Air conditioning is the obvious solution. However, you have to be careful what type of air conditioning units are selected. Window units are usually the first to come to mind. But since most modern offices have windows that do not open, and architects do not want units bulging out of an architecturally smooth building, they are mostly ignored. In addition, most window units require a lot of power and are not designed for continuous operation. Also, window units do not control humidity levels and may do more harm by drying out the computer's environment, producing harmful levels of static electricity.

Other 'Solutions'

Opening windows during cooler months may be economical but is also not the ideal solution. The drastic temperature and humidity changes caused by cool air rushing into a warm building can shock sensitive equipment and cause unnecessary downtime or damage.

Another "solution," which was actually suggested in a business magazine article, is the use of floor fans. Unfortunately, this technique is like trying to extinguish a wastebasket fire by blowing on it. Floor fans simply move the heated air around, along with other villains of dependability — dust, soot and, of course, moisture or dryness.

A third solution has also been tried, but is perhaps as primitive as the floor fans. Its called spraying water on the carpet. As it implies, this involves actually dampening the rug in the computer room with tap water to increase the room's moisture level. Be careful, though, that you don't accidently get water in the AC socket of the minicomputer.

And be doubly sure that the sprayer hose is made of a nonconductive material or you may be on the receiving end of the computer's electrical power source.

So, with all these less-than-perfect solutions, how does a user create the perfect environment for his sensitive machine? You do it right the first time with controlled process cooling, 24 hours a day, 365 days a year. One 3 kW minicomputer in an open office

(Continued on Page SR/14)

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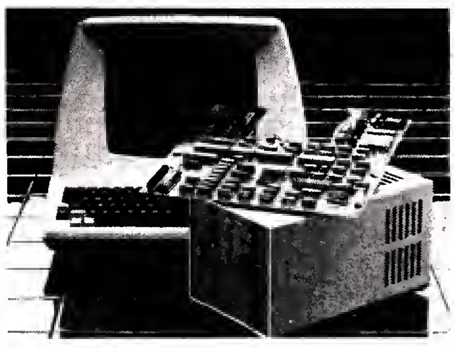

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Beware of Overemphasizing Benchmarks —

By Robert Davis
Special to CW‡

During the process of evaluating a new computer system, it is common to run a test program to measure the effectiveness of the new system's hardware and software.

Old-fashioned techniques of evaluation included instruction timing mixes and kernels. But instruction timings are no longer valid in today's microprogrammed and cache designed computers. Instruction timings totally ignore CPU prefetches, overlapped execution, instruction look ahead, operating system overhead and system calls. More advanced evaluation techniques today include benchmarks and simulation. Simulation programming is sophisticated, takes lots of time and requires a qualified technical staff. Therefore, many companies are utilizing benchmarks as a basis for predicting the new system's performance.

The entire process of creating, executing and evaluating a benchmark is rarely performed in a proper manner. Time after time companies will buy a system after an elaborate benchmark effort only to find the system does not perform as expected. As with any performance test, there are risks associated with using benchmarks as a variable in evaluating computer systems.

Often a company will select an existing application program as their benchmark. However, using an existing application program as a benchmark will not always give a true representation of the power of a new computer system. The current application may execute properly on the proposed computer system, but what happens when the work load increases 300% or 10 more remote stations are added to the new system?

The existing application program cannot present the expandability or maximum throughput of the new system. Try selecting small subsets of the application program and executing them in a multitasking environment. But be careful because true multiprogramming is difficult to measure computer to computer. Your benchmark program should focus on the specific subfunction that will tax the new system such as: a DBMS, many interactive terminals, arithmetic crunch and real time response.

There is no standard way to load

Heat, Humidity Mini's Dangers

(Continued from Page SR/12)

typically requires two tons, or 24,000 BTUs, of spot cooling and humidity control. You must surround your mini with cooled, humidity-balanced air.

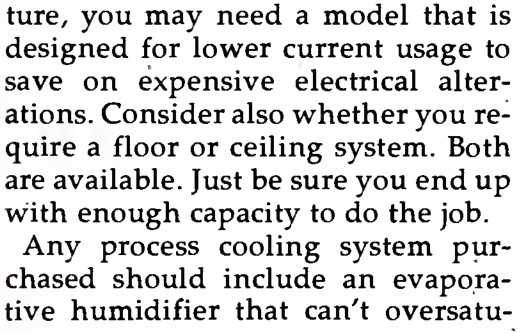
Typically, a two-ton, spot-cooling system with a total capacity of about 24,000 BTUs at an 80° room temperature can sensibly output as much as 18,000 BTUs of cooling power. Installing a smaller cooling system is simply a waste of money.

Professional assistance should be sought to meet specific cooling needs and installation requirements. Since you can't very well run pipes up the side of a high-rise office building, users should opt for a process cooling system that does not require external piping. If you are in an older structure, you may need a model that is designed for lower current usage to save on expensive electrical alterations. Consider also whether you require a floor or ceiling system. Both are available. Just be sure you end up with enough capacity to do the job.

Any process cooling system purchased should include an evaporative humidifier that can't oversaturate the environment, one that is rated for 50% relative humidity at 100% capacity. Other types of humidifiers either boil or spray water to add humidity and are controlled by switches that can fail and dangerously overhumidify.

The key to proper selection is a complete evaluation of a computer's environmental problems and an inexpensive yet sufficient solution.

Levy is an engineer and president of AC Manufacturing Corp. in Cherry Hill, N.J.



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Vendor Variations Can Change Results

I/O via a benchmark program and often I/O is the key portion of an application program. Be sure your benchmark, evaluation criteria and key computer characteristics are consistent.

When a benchmark is run by itself with an operating system, the results are much different than when the benchmark is run with other programs and an operating system. The latter case is more representative of the real world. Some benchmarks have imbedded code or operating system "hooks" that preclude other vendors from participating in the evaluation. This is when a subset of a program is ideal. Most benchmarks are written in Fortran, Cobol or Pascal to increase the portability of the benchmark, which will again allow more vendors to participate.

Benchmarks geared to optimizing compilers are risky because results can be invalid in a real environment. Benchmarks with many small DO loops will be executed especially fast in a cache-designed computer. Benchmarks of these types will give impressive execution times but ignore application I/O interference.

When a benchmark package is submitted to a vendor it usually consists of a standard 800 or 1600 bit/in., nine-track magnetic tape with blocked or unblocked 80-byte records. A vendor can then utilize its software editor to manipulate the program. Source listings, instructions to administer the program and a sample of the output should also be included. The sample of output is important because floating point and character formats vary from system to system. This will save a vendor time in assuring the results are correct.

Allow Time

Also, allow a vendor 30 to 60 days for a benchmark effort depending on the size of the program. Insufficient time may preclude qualified vendors.

The size and cost of a benchmark effort should be a relative reflection of the size of the potential business. Most vendors will only run a benchmark when they are sure the customer is committed to the project and will acquire a system. Also, when a customer allows a vendor complete freedom in putting his application program on the proposed new system this is not a benchmark; this is free program development.

Resources invested into a benchmark effort do impact other business opportunities. Occasionally a vendor will suggest an industry standard benchmark in lieu of a customer benchmark as a time saving measure.

(Continued on Page SR/16)

Witnessing A Benchmark Assures Validity

By Robert Davis
Special to CW

Users should witness all benchmark executions made by a vendor, especially for a large or critical system.

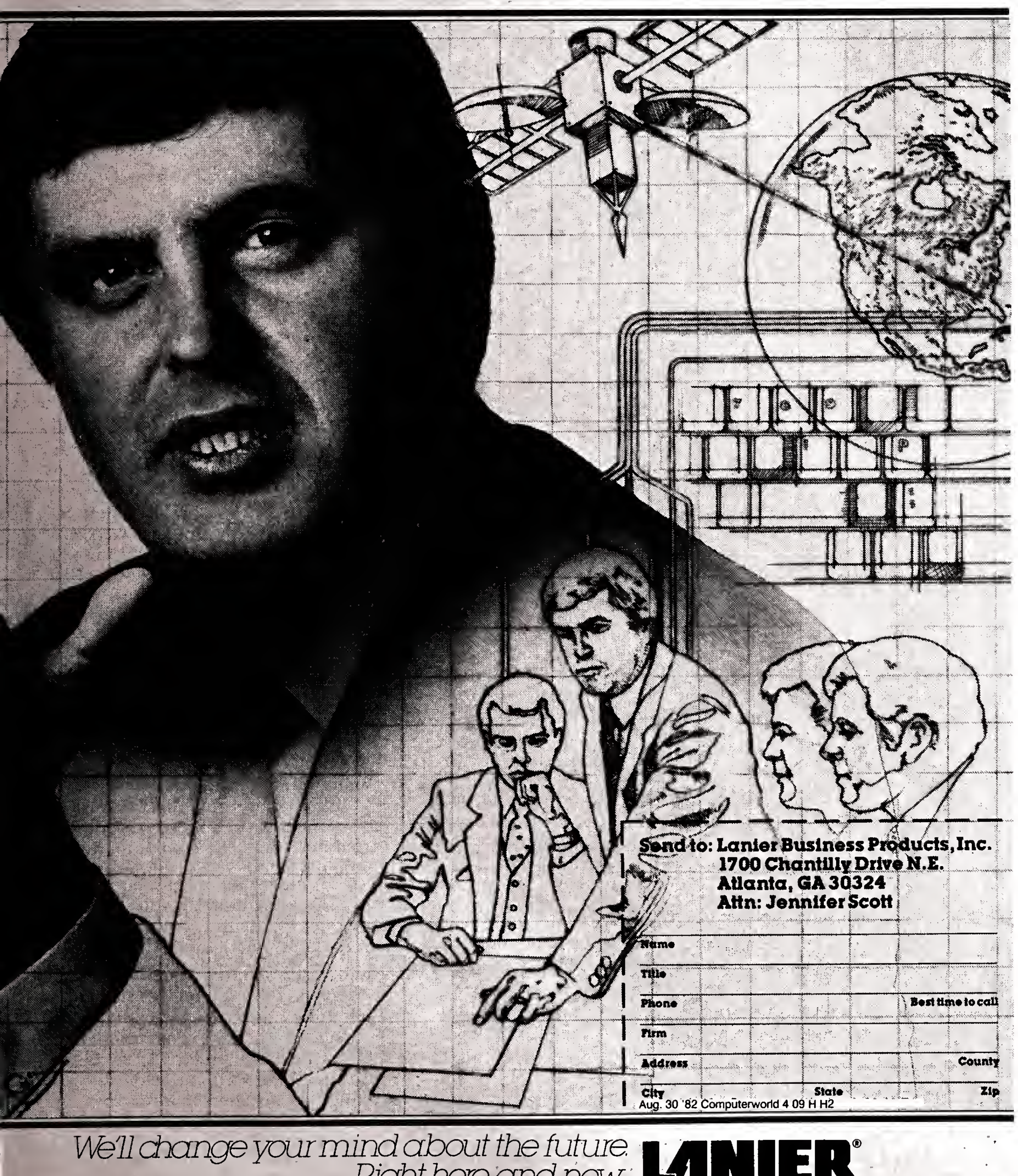
About 90% of government organizations actually witness benchmark execution because it is generally required. On the other hand, about 50% of commercial customers witness benchmark tests. The time and money spent witnessing the test will help assure the validity of the results.

Execution time should not be the only consideration in the system's benchmark. Realistically, the importance of benchmark time is dependent on the user's environment. Granted, solving differential equations in a real-time simulation environment must be done quickly or the final system will not have proper fidelity. On the other hand, waiting an extra 10 minutes for an inventory report or a batch job to complete often is of no consequence.

For example, one customer considered the benchmark test passed by a vendor as long as the program executed in less than one hour. Getting this particular program executed in 50 minutes or 30 minutes was not important because another dependent process was often not completed. But over an hour for execution time was deemed unacceptable in its environment. This approach allowed more vendors to be evaluated.

Benchmarks should not be taken lightly. They are expensive, subjective and are always a token representation of what the customer would like to do. If a company does not overemphasize benchmark results and is aware of the vendor's perspective it will maintain control of its computer evaluation process.

"Control." Reg Parker, Director, National Accounts Marketing, Electronic Office Systems Division



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Vendor Variations Noted For Changing Benchmarks

'They've Formed a Union'

(Continued from Page SR/15)

This approach usually is of limited value since these benchmarks have no relationship to the intended application, highlight only the strengths of a given system and ignore other relevant variables such as operating system overhead or terminal response characteristics.

There are situations where a variety of systems need to be tested and an industry standard benchmark such as the Whetstone I may be helpful in identifying viable suppliers. The Whetstone I has been executed on most current minicomputers and does present the raw power of a CPU (not the system). Be sure the vendor has not bastardized the Whetstone I program to match its sales claims.

A professional vendor will not modify or expand benchmark code unless requested to do so. A vendor often will say he had to make "a few changes" to get the program to execute. All of these "few changes" must be clearly presented to the customer. Manufacturer A may run the benchmark as is, with I/O, on the basis the benchmark actually reflects the customer's application. Manufacturer A makes no assumptions and takes no liberties. Manufacturer B will run the same benchmark but may nullify I/O instructions at execution time. Manufacturer C will run the benchmark and delete all I/O instructions before compilation. Manufacturer D may convert portions or all of a program to a different language because the submitted language does not execute efficiently on its system.

A sophisticated vendor will test a benchmark for worst case. For example, if the benchmark was to be run with 100 transactions per minute they will run at 150, 200 or 250 transaction per minute until the program fails. The vendor may reduce the amount of available memory or simulate other hardware conditions to discover other limitations of the program.

Check That Benchmark

Vendors often execute the same benchmark on different model computers with different performance-enhancement options. Again, a professional vendor will give the customer execution times for all systems with performance enhancements clearly identified. Never forget the relationship between the exact system you plan to acquire and the system the benchmark was executed on. They may not be the same.

When a customer says to the vendor, "use your standard timing routines for this benchmark," some vendors may take liberty in defining a "standard" timing routine. You must understand the logic and function of each vendor's system timing calls. Some commercial systems exclude all operating system service times, all I/O activity times and all CPU contention times from "standard" timing routines. Also, it is easy to time a whole program or any portion.

Typically 10% of the code of a benchmark accounts for about 75% of the execution time. Sophisticated software-optimizing instrumenters will easily identify these processor-intensive code sequences. A vendor (or user) can optimize this code by "hand" optimizing Fortran source, changing loop structures, using in-line assembler language or customizing microcoded subroutines in writable control store.

Davis is a branch manager for Gould S.F.L. Computer Systems Division in Greenbelt, Md. He is also president of the Baltimore chapter of the Data Processing Management Association.

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Cash-Poor Museum Uses Personal Energy To Hustle, Obtain Gratis DP Equipment

Special to CW

SAN FRANCISCO — In a place where ideas find shape in an endless display of ingenious and often beautiful devices, the idea for a general-purpose microcomputer to control office paperwork seemed like one whose time had come.

However, Frank Oppenheimer had a problem. As director of the San Francisco Exploratorium — where half a million people annually interact with more than 500 exotic exhibits — he knew he needed a small but very powerful system capable of word processing, accounting, scientific programming and exhibit development. But any equipment had to be obtained gratis through private donation because the unique showplace is incorporated as a nonprofit, tax-exempt public museum.

So Oppenheimer turned the job over to his assistant Ron Hipschman, a self-confessed lifelong hacker with strong contacts in the computer industry.

"Our office workers were typing letter after letter to government agencies, private foundations, corporations and individuals, changing only things like the names and addresses," Hipschman recalled. "Grant proposals were written and rewritten and rewritten again. In addition, our accounting department is hooked into a data processing service, which costs quite a bit of money. We were wondering whether or not we could do it ourselves."

And in place of phototypeset text, the museum's graphics department was producing some type with an IBM executive typewriter.

Get It Donated

At the time, Hipschman was using his own personal computer at the museum to work on a book project. "I was keeping the computer at the Exploratorium so that I could work on the book here," he explained. "I wanted to take the machine back home. I realized that we weren't going to buy one like it because we're a very cash-poor organization. So I decided to go out and get the equipment donated."

Hipschman's efforts were rewarded with a state-of-the-art business/scientific microcomputer system, valued in excess of $15,000, that can grow indefinitely along with the museum it supports.

The Exploratorium spreads across 86,000 square feet of floor space in the Palace of Fine Arts, located in San Francisco's marina district near the Golden Gate Bridge. The museum specializes in science, technology and human perception, offering the public hundreds of exhibits dealing with sound and hearing, touch, vision, color, light, patterns, waves and resonance, motion, electricity, heat and temperature, exponentials and plant and animal behavior.

The museum requires an annual budget of $2.4 million to operate and employs a staff of 53 full-time workers to build the exhibits, serve the customers and take care of the business.

Successful Search

"Cash-poor" is the catch phrase most commonly used in the business office at the Exploratorium, and it was the driving force behind Ron Hipschman's search for companies to provide the museum with a business computer.

After hundreds of phone calls and some requests, Hipschman managed to assemble:

- A Compupro system S-100 bus microcomputer system containing a Zilog, Inc. Z80 microprocessor and a 64K-byte random-access memory board.
- A direct memory access floppy disk controller interfaced to a pair of single-sided, 8-in. Shugart Associates, Inc. floppy disk drives with an on-line capacity of 600K bytes per drive.
- A 40 char./sec Diablo Systems, Inc. letter-quality printer and an 80 char./sec dot matrix printer.
- A modem from Hayes Microcomputer Products, Inc. and a VT100 CRT terminal from Digital Equipment Corp.

To accompany this hardware, Hipschman managed to obtain a variety of software ranging from Digital Research, Inc.'s CP/M to Sorcim's Supercalc.

"All that software was donated and we purchased Wordstar 3.0 with Mailmerge from Micropro Inter-

(Continued on Page SR/20)

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Built in 300/1200 acoustic coupler	Yes	Yes	Cuts telecommunications costs; flexible access to any data base, from any telephone.
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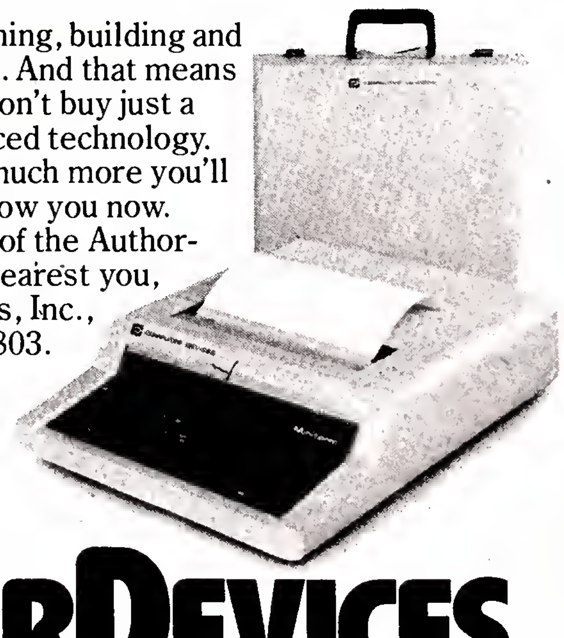

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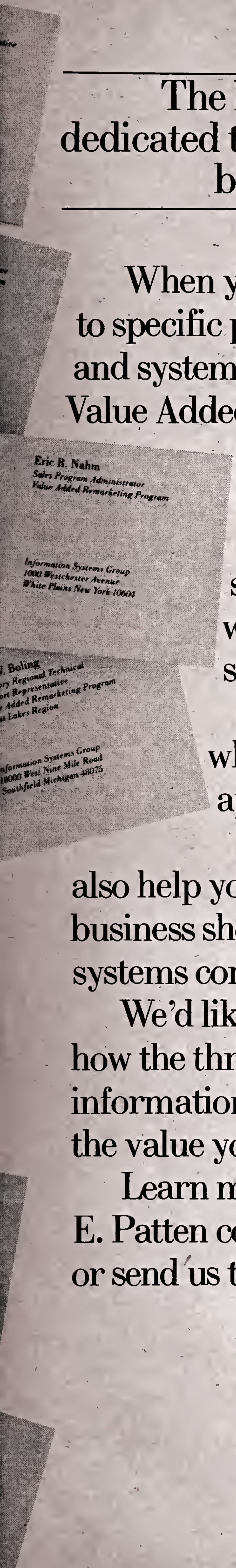

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Cash-Poor Museum Hustles Gratis DP System

(Continued from Page SR/17)

national [Corp.]," Hipschman said. "We use the word processing for membership letters, thank-you letters, contracts, grant proposals, fund raising materials, typesetting and, eventually, graphics. Now we can merge names into form letters or contracts and save all that rekeying time."

Hipschman uses a Systems Plus, Inc. FMS-80 data base management system to generate reports from the Exploratorium's data files without writing any programs.

"Right now our accounting applications take the bulk of the computer time," he said. "The data processing service runs our accounts payable, accounts receivable, general ledger and payroll, and we can't do inventory because of the limited disk capacity. So the primary accounting applications for the microcomputer are keeping track of the insurance on our exhibits and check disbursements."

The Exploratorium uses five Apple Computer, Inc. microcomputers as exhibit controllers and display devices and two Atari Corp. micros in a language exhibit. Pascal, Forth, Mulisp and Mumath are used as development languages when the staff prepares exhibits. "We can use these languages for most applications that we have to write software for," Hipschman explained. "They're just other languages, like Basic or Fortran, though we haven't had much call yet for either of the latter two in the office area.

"The Compupro system is an excellent business and scientific microcomputer," Hipschman asserted. "And because of the versatility of the S-100 bus, we can put virtually whatever we want into the computer."

He indicated that later this year when the museum seeks to add graphics capability, he will choose from a multitude of available graphics boards that, though competitive, would all be compatible with the S-100 bus.

As a key factor, Hipschman cited the Compupro system's ability to handle 8- and 16-bit dual processors from chip makers as diverse as Intel Corp.; Zilog, Motorola Semiconductor Products, Inc. and National Semiconductor Corp.

"You can do things with this system that you could never do with a 'canned' system," he said.

Ever mindful of increasing demands for more computer power and access time, Hipschman has outlined a growth path toward multiuser capability.

"We need memory and terminals," he said. "We're going to be putting four terminals on the computer — Lear-Siegler, Inc. ADM-32s, which have, of course, been donated."

The Exploratorium will also be running a special version of MP/M, MP/M 8-16 from Compupro.

"It requires their dual processor board, which has the advantage of being able to run either Intel 8080/8085 or 8086/8088 microprocessors. It will allow us to run CP/M 80, CP/M 86, MP/M 80 and MP/M 86 programs simultaneously. All of our current software library will still be viable," he said.

Another upgrade for the MP/M system is a 29M-byte hard disk that Hipschman has asked Shugart to donate. "We want to keep all of our accounting files on it — checks, exhibits, surveys and payroll," he said.

Another application Hipschman has set his sights on is a weekends-only public-access electronic bulletin board.

"Anyone could call in with a message dealing with science, technology or the arts," he explained. "They could have an event happening, or some equipment to sell, and they would want to get this information to people who would be interested."

And soon the Compupro system will have a modem installed. "It will help our graphics department," he said. "We'll design our graphics here and type in the copy. Then, rather than physically carrying paper to our phototypesetter, we will send our data straight to their typesetting machine over the phone lines."

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To Avoid Legal Problems Later

Get Promises on Paper Before Buying System

By Gary Oliver
Special to CW‡

There is only one thing that frightens a new computer user more than the possibility of a computer not being able to do the work as promised. That is the legal problems that might occur if the system's problems are serious or have a great impact on the user's business.

Problems basically come from four sources:

- A user's eagerness to acquire the latest in business advances and technology.
- The salesman's promises made in his eagerness to earn a commission.
- The vendor's promises made in its eagerness to maintain its position within the computer industry.
- The programmer's promises in his desire to maintain his reputation.

All four reasons are driven by profit. That's not to say that profit makes them all bad. The question is, how do we get these promises into a manageable situation?

First Rule

The first rule of buying is to list on paper everything you reasonably expect and want, taking into account the reasonable growth of your business. Go to your attorney and have him help you draw up your own contract in your own words, with your own delivery date and your own anticipated needs. Put down in writing all of the salesman's and vendor's promises — especially with regard to delivery dates and the computer's expected performance as well the performance of the programmer's programs.

I cannot stress too strongly the importance of writing all this down. If the vendor or programmer only offers you his contract, turn it over and read the fine print. I know of at least one contract in existence that states — although not in so many words — that the vendor will not even guarantee the intended use of the computer or even that it will run.

Unfortunately, even following the basic rules of listing your requirements and getting everything down on paper does not guarantee that difficulties will be avoided.

If a lawsuit does occur, the first problem you'll encounter is finding an attorney who knows something about the computer industry. In a large city, even if you do find an attorney with experience in the computer industry, you will find him very expensive. Besides cost, there is also time to consider. You might think that you can just dump the problem on the lap of your new attorney and he will solve it for you. This is not the case. Usually, you will have to be present at all times during the action, which absorbs an immense amount of time.

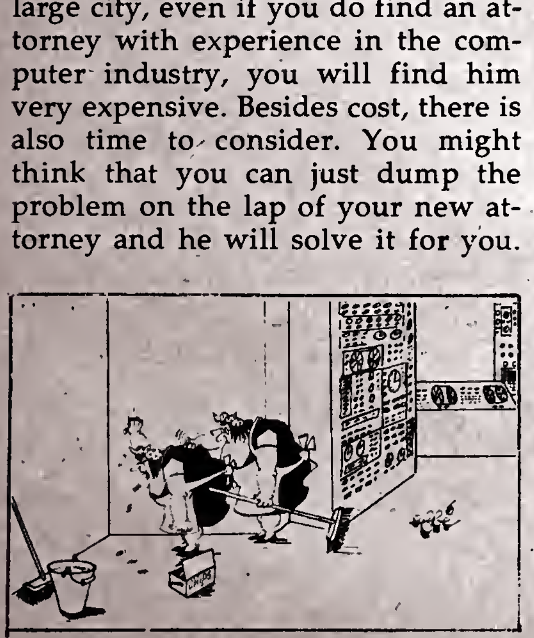
When you find an attorney willing to take your case, perhaps you're going to have to educate him in the computer industry. Keep in mind that he has other things to think about. If the attorney requires outside help, he may choose to hire expert witnesses that specialize in a specific aspect of the computer's operation. These witnesses also cost money. In the long run, the total bill for lawyers, witnesses and other legal expenses could easily reach two times the cost of your computer system.

Summing up, you should ask yourself the following questions and find the answers before committing your company to a computer:

- Where would I find an attorney?
- How much of my time would this end up taking?
- In dollar costs, how much would I have to spend and would it jeopardize my business?
- Would I have to educate the attorney?
- Would I be willing to spend three or four years of my time bringing this action to trial?

The answers to these questions are not meant to discourage the new user, but make you think about what might happen if you are not careful about evaluating your business, the vendor, the salesman and the things all of these people have told you.

Oliver is president of Century Automotive Machines, Inc. His ideas are part of a published booklet called So You Think You Need A Computer.



Diablo announces the first 400 character daisy wheel printer.

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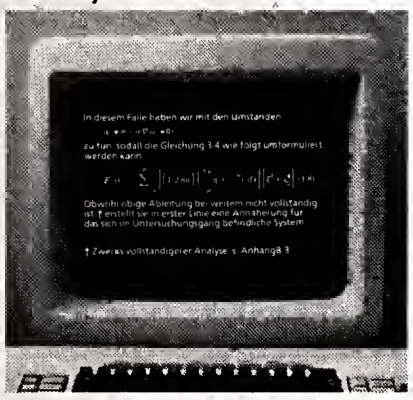
Until now, if a business needed a printer with a wide range of scientific or multilingual characters, the choices were severely limited. And so was the print quality. Not to mention that prices were high and reliability low.



But now Diablo introduces the 630 ECS* printer. The first 400 character daisy wheel printer in the world. For technical, legal, or multilingual business applications, no other printer comes close. It's the best alternative to twin daisy wheels and multi-pass matrix systems.

Only the Diablo 630 ECS gives you true extended character set applications on one print wheel. Printing at 33 cps average English text, the durable new print wheels developed by Diablo do more than just increase character count. They provide real compatibility between the system screen and the page.

What the host shows, Diablo prints. Without changing wheels. Even if it's $F(\tau) \approx \eta(\tau) \epsilon^{-2v} v\, d \rightarrow \infty$ $(or\ \nabla\omega \rightarrow 0)$, for scientific applications. Or a combination 10 or 12 pitch or *italic type* for legal applications.

International business languages frequently call for hundreds of characters. Now, companies who use Teletex or any West European language can rely on a Diablo printer to do the work. And to do it without changing the print wheel.

The new 630 ECS printer is based upon the regular Diablo 630 which has an MTTR of less than 30 minutes and an MTBF of more than 4000 hours. And, except for the carriage, has common spares.

If you would like to know more about the Diablo 630 ECS, write to: Diablo Systems, P. O. Box 5003, Hayward, California 94545.

We believe it will shortly become the standard of the industry. It's as simple as that.

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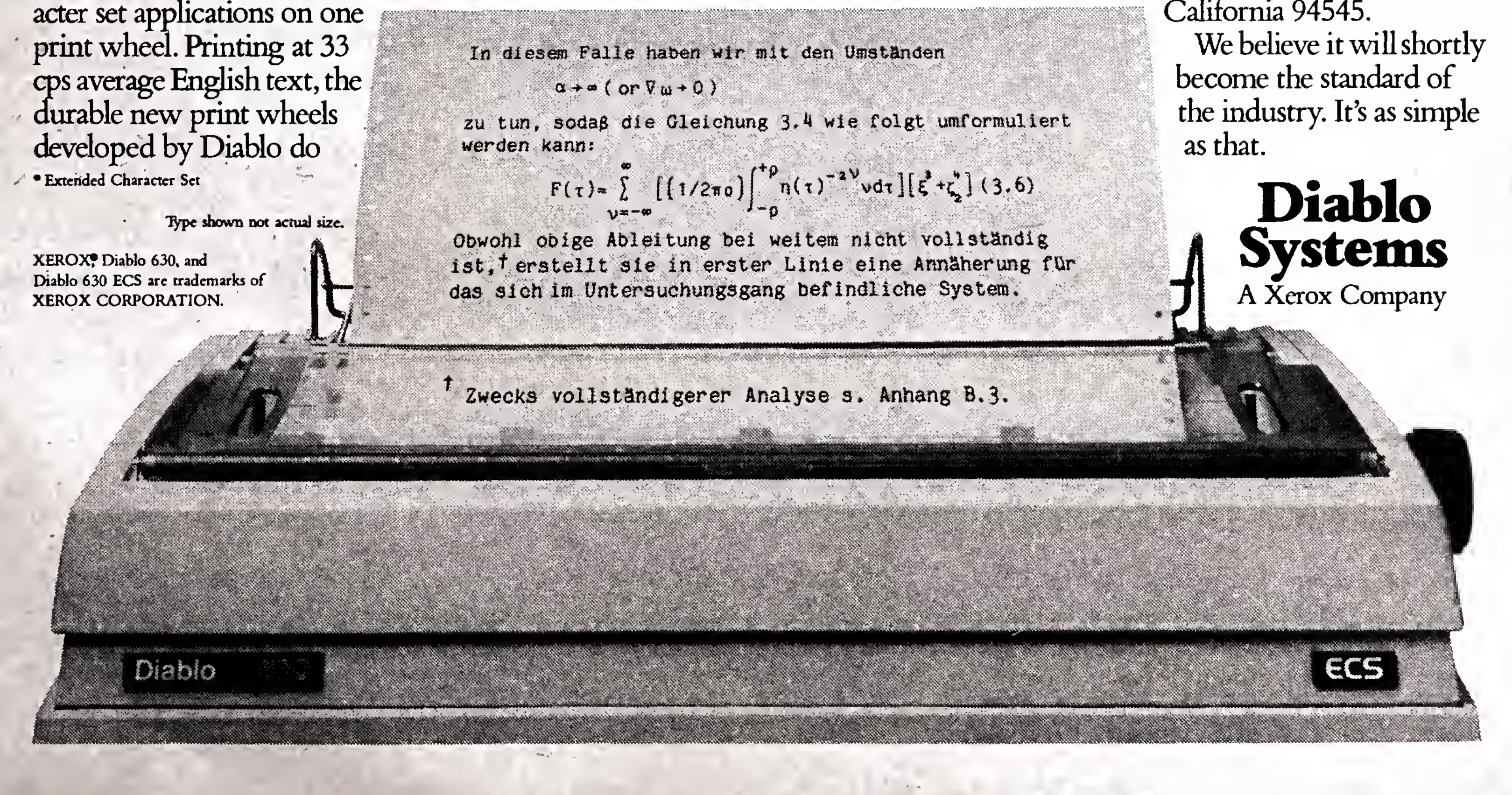

In diesem Falle haben wir mit den Umständen

$\alpha \rightarrow \infty\ (or\ \nabla\omega \rightarrow 0)$

zu tun, sodaß die Gleichung 3.4 wie folgt umformuliert werden kann:

$$F(\tau) = \sum_{\nu=-\infty}^{\infty} [(1/2\pi o)\int_{-\rho}^{+\rho} n(\tau)^{-2\nu} \nu d\tau][\xi^{3}+\zeta_{2}^{4}] \quad (3.6)$$

Obwohl obige Ableitung bei weitem nicht vollständig ist,† erstellt sie in erster Linie eine Annäherung für das sich im Untersuchungsgang befindliche System.

† Zwecks vollständigerer Analyse s. Anhang B.3.

* Extended Character Set

Type shown not actual size.

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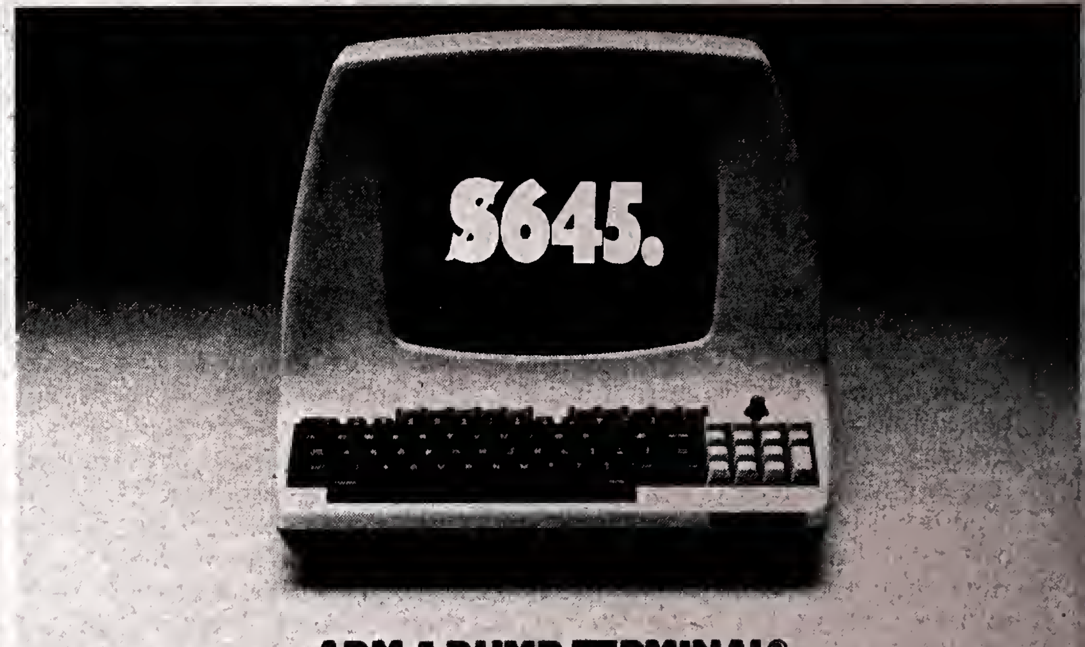

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Equipment Corporation.

Eliminates Half of Clerical Staff

County System Battles Pinch of Lower Taxes

BALTIMORE, Md. — Like most government agencies across the country, Baltimore County is feeling the pinch of lower tax revenues.

While the population has quadrupled since 1940, residents' incomes and income to the state have shrunk. However, the county's needs have expanded and more services are required.

This means that the state must watch every penny that is spent on purchases of everything from machinery to paper clips. Fortunately, the county uses a computer to keep track of expenses.

Cuts Clerical Functions

The computer has not only eliminated at least half of the county's clerical functions, but manages about $40 million in commodities and services a year, according to Dan Szetela, the Baltimore County buyer.

The county stores about 7,000 "catalog" stock inventory items in a central warehouse and related storerooms.

Another 30,000 items are considered "nonstock" and are acquired from vendors ranging from companies the size of Georgia Pacific to the local photo store in Pikesville. The county's buyers must serve the basic purchasing needs of all 27 county agencies and departments, assuring the best possible use of valuable tax dollars.

In the late '70s, the county launched a long-term program to develop a management information system (MIS) with data communications to all key agencies and departments. Not surprisingly, the system had to be computer based. While the county's program has come a long way from the drawing board, it is still very much in an evolutionary stage.

The first step in the system to be developed was the "midsection" of the purchasing process — the labor-intensive and delay-prone steps of processing a purchase requisition and purchase order. One goal was simply to increase productivity, while the other was to develop a data base/data communications approach with a purchasing module compatible with plans for a full MIS, a county spokesman said.

The system itself is straightforward. When one of the county's agencies wants something it submits a requisition to the Central Purchasing Department in the Office of Central Services. Requisition data is keyed into display terminals linked to the county's IBM 4341 computer. All data is edited and verified for accuracy, and a log of incoming requisitions is generated on a nearby printer.

The requisitions then go to buyers like Dan Szetela for bidding, vendor selection and any other action required. Buyers then note vendor, terms, delivery and specifics on a form and return the form to a data entry clerk. This added information is entered into the computer and orders are batch printed each night.

"I would estimate we have cut processing time for a typed purchase order several days," Joanne Deitz, a purchasing supervisor observed. "In addition, the backlog of requisitions awaiting processing — two to six days at times — has been virtually eliminated."

The computer-based system has full inquiry capabilities and a variety of output methods, Deitz said. Departments can query the status of any commodity, requisition, purchase order or related file at any time. But the main feature of the on-line system is its interface with inventory. In effect, it is a purchasing and inventory control system, with on-line inventory functions in development.

Baltimore County buyer Dan Szetela claims the on-line purchasing system has eliminated at least 50% of the clerical functions in his work. Szetela recently saved the county $100,000 when the computer helped detect a 'stockpiling' order.

One of the first steps in automating purchasing procedures was conversion of the inventory file to a format compatible with both systems. The file contains buying history, storeroom location, available stock and reorder information.

The first part of the system's "phased development" is reportedly eased by using IBM's DL/1 and Display Management System (DMS). DL/1 affords data independence in programming, which allows the staff to add MIS modules easily, DP director Barbara J. Kuebler said. DMS cuts the programming effort needed to provide screen displays, boosting productivity by up to 50%, she added.

The Second Part

The second part of the system's development will automate the financial encumbrance process for each requisition, further tightening the purchase-order cycle, while the third phase will automate certain aspects of bid preparation and analysis, maintaining a permanent register and mailing list of all qualified vendors.

Ultimately, the entire purchasing cycle will be automated from submission of a requisition to payment of vendor invoices.

"We're using technology to get the most from tax dollars to stretch the budget," Deputy Director John Miller observed. "The system is reliable, proven, cost-effective. It helps us track commodities, see where we're spending the most and concentrate on the larger dollar purchases."

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Service Bureau Data Base Solves Insurer's Ills

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HOUSTON — Having a centralized computer and a data base full of information is definitely an advantage — especially when the data stored in the computer changes and is updated almost on a daily basis. But what do you do when the people who can benefit most from using the machine are located far from the computer's site and are usually not at the same place at the same time each day?

The Great Southern Life Insurance Co. here solved that problem by bringing its computer — or rather, its resources — to its people. However, the computer is not its own, but a data base maintained by a third party that specializes in providing insurance-related information.

A little more than a year ago, Great Southern began providing portable computer terminals to its general agents as sales tools. By the end of last year, 80% of the agents were using these terminals almost on a daily basis, according to Raymond H. Stallings, senior executive vice-president of the firm.

Great Southern, based in Houston, markets insurance products in 38 states. In 1981, the company wrote more than $1 billion of individual life insurance, up from $650 million in 1980. In fact, new sales of individual life insurance are expected to reach $1.5 billion by the end of this year, Stallings said.

The firm's agents use Keypact terminals provided by Computone Systems, Inc., an Atlanta, Ga.-based company that also provides financial planning and life insurance policy information services. Computone has an extensive data base of more than 4,000 life insurance plans offered by more than 240 life insurance companies, including Great Southern, and an applications software library of more than 660 financial planning and policy illustration programs. All of these may be accessed on a time-sharing basis via telephone using the company's terminals.

Computone presently has two IBM 4341 computers and related peripherals that store and maintain all the insurance-related data.

Simple Reasons

The reasons Great Southern turned to a third party to provide explanations of its services to clients are simple. Requesting proposals from the home office, the usual procedure after discussing policies with a client, would require a turnaround time of several days. And tailoring the policy to meet a client's needs and goals often requires more than one proposal to close a sale, according to Tom Brophy, the firm's executive vice-president who, at the time of the system's introduction, was the senior vice-president in charge of data processing and information systems.

The company turned to computerized illustration.

"The Keypact terminal is portable, can illustrate proposal after proposal in front of clients, eliminates the turnaround time of going to the home office and is affordable," Brophy said, pointing out that, at the time, Computone was the only firm that offered this kind of a service.

The company did consider microcomputers and traditional service bureaus. However, in 1980, microcomputers were not as portable as the Computone equipment and cost an average of five times the then-current $2,500 price of the Keypact terminal. Service bureaus were considered too slow since agents needed information on the spot and that information often changed or was amended frequently.

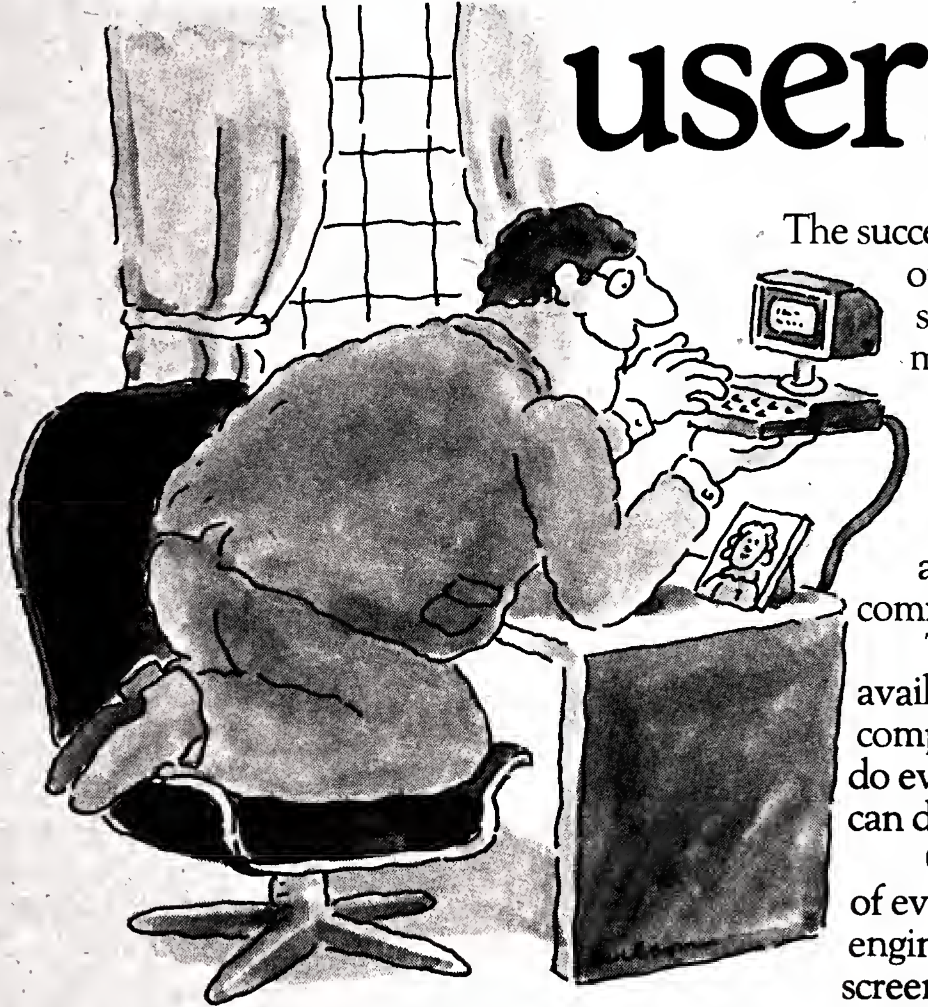
"I saw [Computone] as a tool which, from the marketing side, performed many of the tasks I felt were important," Brophy said. And the terminals are a communications tool "that eliminates the U.S. Mail, Federal Express or other communications services and gives agents immediate access to information they need to do their jobs better," he said.

Under a plan that provides the terminals at no cost to the agents other than their actual on-line use charges, the insurance firm has acquired more than $500,000 worth of terminals, Stallings pointed out. Agents meeting a minimum level of production for a six-month period continue to possess the Computone terminal at no charge — other than for on-line use — for the next six months. However, monthly rentals are charged if production goals are not met, he noted.

Besides being an effective tool, the terminals are a "primary attraction" in recruiting experienced agents, Stallings said. General agents contacted by Great Southern average about seven years of experience, while other agents normally have at least three or more years of experience.

"Among the primary attractions for agents in joining us is that we have the backup of a proven computer system," he said.

Very small terminals for IBM users.



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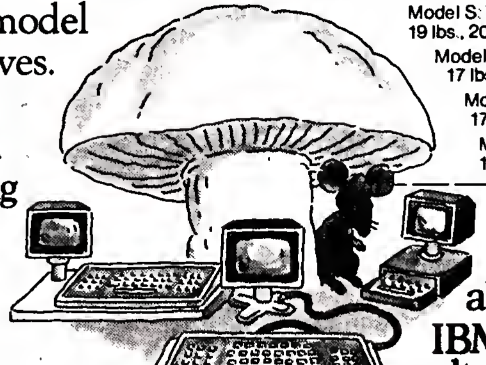

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DUBUQUE, Iowa — Putting a minicomputer into an average-size company and giving it the responsibility of handling the records of hundreds of employees or clients is no easy task. This problem becomes more impossible, however, when the computer is asked to take care of the employees in hundreds of firms and to maintain records that may differ from business to business.

But that is exactly what Cycare Systems, Inc., a data processing service bureau here that caters to the medical profession, does each day.

Incorporated in 1969, Cycare is one of North America's leading providers of data processing services, software and integrated systems to medical group practices. The company currently has about 350 clients and handles such things as appointment scheduling, insurance payment procedures, cash flow and paperwork, Jim H. Houtz, the firm's president and chairman of the board, said.

Physicians who want to become automated, but don't necessarily want to make the commitment of purchasing a computer system, do have other alternatives.

For example, Cycare's processing services offer a menu of plans, consisting of batch, shared resources, distributed and in-house systems.

CRT Terminals Provided

For batch processing, the company provides clients with a CRT terminal and diskette for data collection and off-line storage. The data is transmitted late over telephone lines for processing at either of Cycare's two corporate locations. After processing, invoices and insurance claims are mailed directly by the firm to clients with detailed reports of these activities.

The firm's shared-processing capability extends online inquiry/response processing to clients, who share the cost for the firm's communications and processing services. For example, clients can use their CRT terminals to query a patient's credit and receive an immediate response. Data remains processed in a batch environment, and Cycare mails invoices to third parties and provides detailed reports for clients, Houtz pointed out.

Distributed processing — the firm's most elaborate service — makes use of both inhouse and remote processing. However, clients maintain complete control over most daily processing functions without requiring a large equipment investment for weekly and monthly "number-crunch" reports, the firm's president said.

Daily processing needs, such as patient account data, insurance invoicing and patient scheduling are handled through the client's own inhouse 16- or 32-bit Honeywell, Inc. DPS 6 minicomputer system. Other functions, such as statement printing, are done remotely over telephone lines by Cycare's three-processor IBM 4341 computers. Clients invest only in the on-site equipment needed for daily processing. The cost for remote processing is shared with other clients, Houtz reported.

The final element in Cycare's service mix is complete in-house processing systems installed at the client's site using Honeywell DPS 6 hardware. Typically, this hardware consists of the DPS 6/96 processor with 768K bytes of main memory.

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Among the many powerful operating features offered by Falco's TS-1 are: • Completely software driven • Up to 17K of data RAM • 16K of ROM • 2K of screen RAM • 256 character input buffer • Up to 28 non-volatile user-programmable function keys • Four different character sizes • Non-imbedded visual attributes • A 25th line for displaying status • And two standard RS-232 I/O ports that permit simultaneous connection with computer, printer or modem • Lightweight (only 26 lbs.) — with extra small footprint.

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SANTA FE, N.M. — Carefully reexamine your operating procedures, pinpoint costs and identify areas of inefficiency.

These might be thumbnail rules of action for any business. However, by using these guidelines and an extremely thorough search process, the New Mexico Motor Vehicle Division (MVD) here has acquired a distributed minicomputer system that not only allows it to offer expanded services, but lets it function well under a tightly controlled budget. In fact, by implementing the system — based on Wang Laboratories, Inc. VS computers — the state has reportedly become a pioneer in applying the concept of distributed data processing to government services.

New Mexico's MVD consists of 74 field offices that handle more than two million transactions each year. Before installing a dedicated minicomputer, every transaction had to be processed at one of the field offices, compiled and then forwarded to the main office here at the end of each day. The main office then validated and reprocessed the information and entered it, along with the information from other state agencies, into a central IBM 3031 mainframe. In all, it took about two to four weeks to process information in this manner, according to Manuel Montoya, the division's data processing manager.

"This meant that the majority of records we had access to were obsolete," he explained. "It was a costly procedure in terms of time, money, efficiency and service to the public."

The division's single-computer woes not only caused internal problems, but inconvenienced the people the agency served. License applicants had to deal with separate departments within the agency to get a single license and wait up to 60 days for needed documents. In addition, a driver's license and automobile title information were almost never handled together. Both were assigned different tracking numbers — which added to the confusion — and it was not unusual for several people to work on the same documents.

Sheer Volume of Paper

The sheer volume of paper in the department was also a productivity hazard. Every day data entry personnel handled about 2,300 titles, 1,200 driver's licenses and, during peak periods, 1.2 million registration renewals, Montoya said.

The state's police departments also complained that the agency's 30- to 60-day delays in processing often caused problems in identifying drivers and their vehicles — especially when an accident or crime had occurred. The result was that police often did not know whom to arrest.

To correct the situation, a committee was formed to evaluate various computer vendors. The committee consisted of Montoya; Jose R. Martinez, a systems analyst for the department; Steven Kirkpatrick, the administrative aide to the state secretary of transportation; and three members from the Data Processing Division. First, the committee formulated a request for information and mailed it to 20 vendors, 16 of whom responded. All 16 vendors were then invited to an advisory session at which the MVD outlined its need and issued a request for proposal (RFP). All 16 firms responded to the RFP, Montoya claimed.

Rather than rely on personal preference, the committee allocated points for desirable features found in each vendor's system. For example, points were awarded for screen development aids such as prompts and menus, text-editing capabilities and vendor training opportunities. When the points were totaled, three vendors came out on top: Harris Corp., IBM and Wang.

The committee attended demonstration sessions at each of the companies, traveling as far as Massachusetts. When the demonstrations were completed, evaluated and the dust settled, Wang received the contract. The Wang system won out because of its "ability to outperform the others in selected tasks," according to a report released by the committee and titled "New Mexico's Distributed Processing System."

"Ease of programming and program development was also an important factor in the choice of the Wang system," Montoya said. "The way programs are developed, written, tested and debugged is much simpler on the Wang system because versatile screen manipulation functions make the whole process really easy."

Pilot Program Launched

The committee's work did not end with the final selection decision. After choosing Wang, it formulated a budget proposal for approval by New Mexico's state legislature and launched pilot distributed processing programs in selected field offices. The division's idea was to establish a distributed processing system built around Wang VS computers in five regional locations. In addition, multiple CRT workstations and printers were installed for documentation and report generation.

Presently, these regional sites are linked to a host IBM 3031 via direct telephone lines. In turn, each regional site is host for several satellite offices and contains driver and vehicle information. Communications with the IBM host is accomplished interactively via the 3270 protocol and in remote batch entry mode via the 3780 protocol, Montoya noted.

Now one clerk can handle what before took a handful of state workers. And New Mexico residents can usually receive necessary documents immediately rather than have to wait up to two months.

The computer not only maintains an inventory control on the sequence of issued documents, indicating when supplies are low, but updates files at the end of each day and allows other departments — such as the police — quick access to state records, Montoya pointed out.

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Business Grows Despite Recession

Mini-Based Net Makes Work Play at Toy Firm

Special to CW

OAKLAND, N.J. — Games, dolls and brightly colored trucks may be the stuff of childhood. But the business end of the toy industry is not all fun and games.

Consider Russ Berrie and Co., Inc., a toy distributor based here that has thousands of retail customers ranging from the massive Sears, Roebuck & Co. to small Mom-and-Pop toy stores. Despite a weak economy, the toy firm has had a growth rate of more than 50% annually for the past several years.

During a typical week, Russ, as the firm is known in the trade, receives up to 4,500 orders from its various customers, with an average of 12 line items per order. The company handles business from its New Jersey headquarters and offices in Georgia, Texas, California and Illinois.

The firm simply could not have maintained that growth if it were not for its computers and communications network, which paid for themselves during their first year of operation, according to Bill Pastore, Russ' director of data processing.

In 1979, the firm's DP facilities consisted of 12 Itel Corp. CRT terminals, located at its Oakland, Calif., headquarters, that were connected in an off-site computer at a service bureau. This system provided next-day DP services when it was operating at its peak efficiency, he said.

Today, the Oakland office has a Basic Four Corp. Model 730 minicomputer installed on-site with a total of four 75M-byte disk drives, 18 terminals and two printers. In addition, in its Georgia, Texas and California divisions, the firm maintains separate Model 730 systems. And the Chicago office has a Model 410 that will soon be upgraded to a Model 710, Pastore said. All of the computers can communicate with one another and with the home office.

Three years ago, the bulk of the firm's data processing duties consisted of order processing, invoicing and cash management.

"We were averaging four to seven hours a week in downtime due to line problems," Pastore said. "Even with 12 terminals, we were having difficulties keeping up with the work load."

At that point, the firm decided to get its own DP system and looked at some of the leading vendors in business computers, including Digital Equipment Corp., Data General Corp. and Management Assistance, Inc.'s Basic Four machines.

After some consideration, the toy firm selected the Basic Four equipment because of its easy programming language and operating system, support and growth path. It was also very competitively priced, Pastore added.

Russ' computer network began with a System 610 located at the Oakland headquarters. It had four interactive terminals that more than made up for the amount of work done by the 12 batch terminals they replaced.

The company also put a small Basic Four System 410 in its four division offices that were equipped to "talk" to the main computer through standard communications interfaces and dial-up telephone lines.

With a transport batch communications 2780 emulation and multirecord feature, Russ is able to do all of its central purchasing from its New Jersey headquarters. It also accomplishes end-of-the-month consolidated corporate reporting from each division.

No Human Assistance

Recently, because of increased business, Russ has leased its own communications line from the telephone company and has added the vendor's Autodial option, which allows the headquarter's computer to call all division computers and communicate without human assistance, Pastore pointed out.

"The system paid for itself during that first year because we operated it with less personnel, we didn't have to train new people, and it helped us to double our business," he noted.

The firm has even learned to cut DP costs by bringing the whole operation even closer to home. Initially, each computer's software was provided by an independent vendor. But over the past years, every computer program has been modified, and others have been added by Pastore and DP manager Alan Heger who, along with the data entry operators at Russ, make up the entire DP staff.

While toys and gifts are Russ' business, the computers are making more play than work for the firm, Pastore observed.

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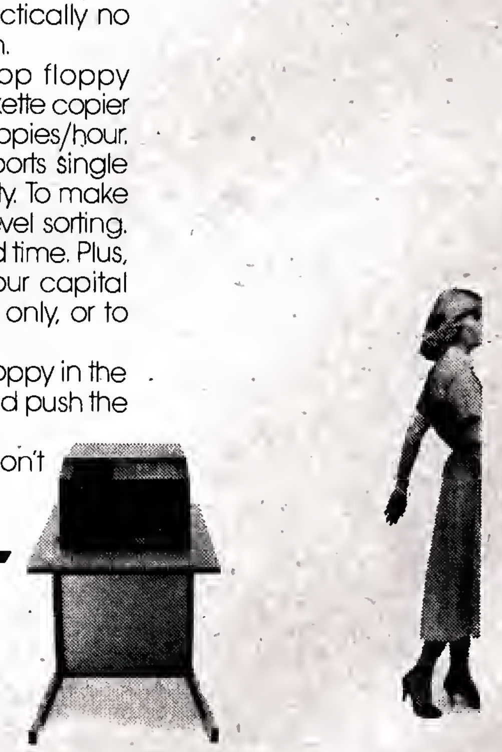

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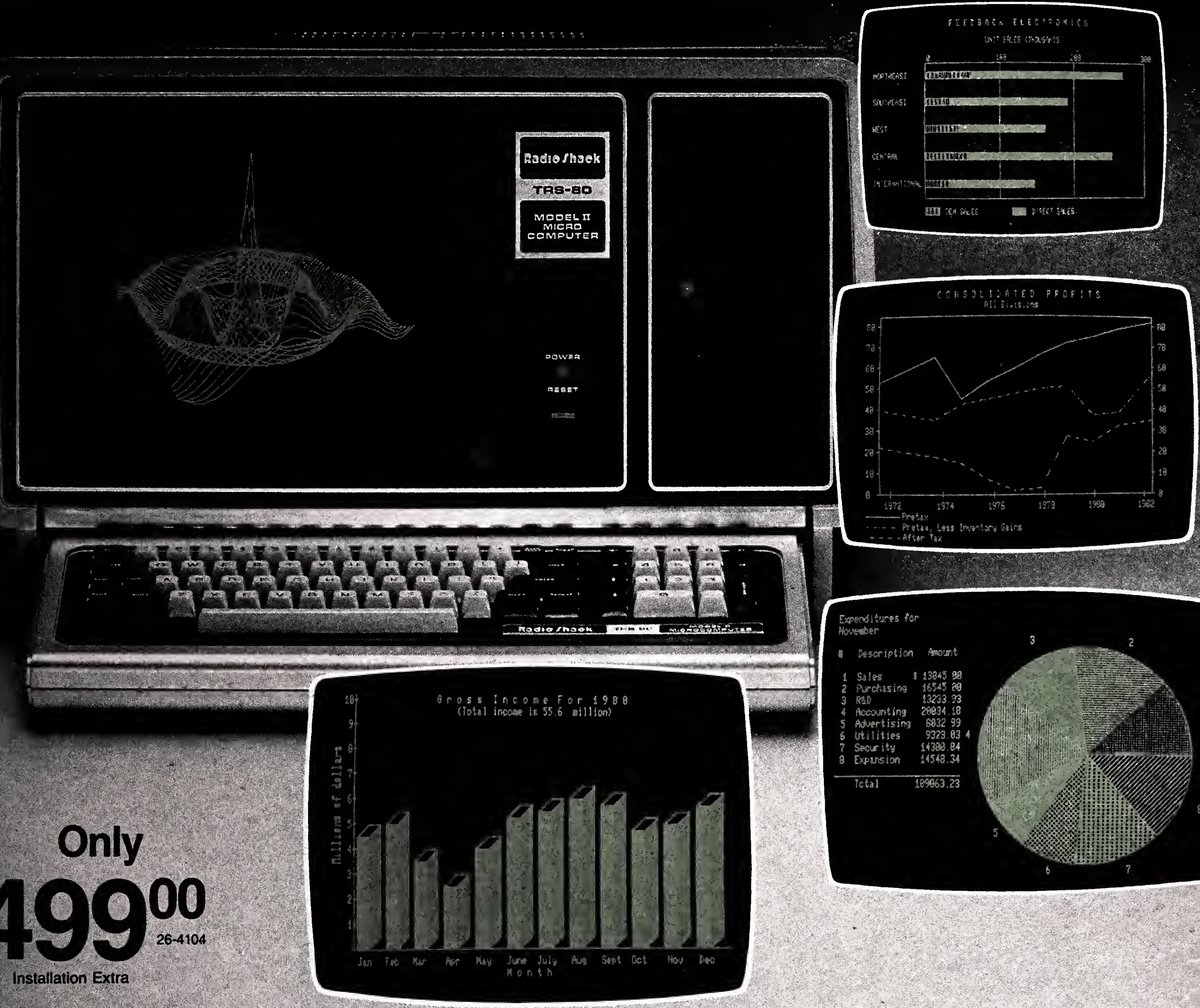

Expenditures for November

#	Description	Amount
1	Sales	$ 13845 00
2	Purchasing	16545 00
3	R&D	13233.93
4	Accounting	20834.18
5	Advertising	6832 99
6	Utilities	9323.03
7	Security	14300.84
8	Expansion	14548.34
	Total	109063.23

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In addition, there's a library of assembly language subroutines that makes the Graphics Option even handier for those who are familiar with COBOL, FORTRAN or Assembler.

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The Graphics Option Kit includes a 32K dedicated RAM memory board that is installed in your Model II in an unused expansion slot. You also get a user's manual, diskette with Graphics BASIC and a subroutine library. You can get a demonstration of the Model II with high resolution graphics at any Radio Shack Computer Center.

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Self-Analysis Key to Small Business Computing

By John Crawford
Special to CW‡

As the owner/manager of a small business, you already are experiencing intense competition for your customer's dollar — competition that will become even more fierce in the future.

The primary reason for this is that more of your competitors will be using computers in their businesses.

According to the Department of Commerce, of all U.S. companies that employ less than 500 people, fewer than 200,000 firms now own small business computers — 3.4 million small businesses do not. But, this same government survey predicts that more than 75% of these companies will buy a computer within three years.

The owner of a small business can now justify purchasing a full-featured, professional small business computer. Price is no longer an obstacle, since low-cost computer systems often can be paid for in savings within a year or two. These savings come from reduced labor expenses, shortened billing cycles, reduced inventories, controlled costs, improved cash management and more controlled business growth.

However, so many small business systems are now available that the prospective buyer faces a bewildering array of questions, which must be answered if the purchase is to be right:

1. What business functions should the computer perform that would increase revenue and/or reduce cost? These can include order entry, inventory control, accounts receivable, accounts payable, general ledger, payroll, word processing, financial modeling, statistical studies, business graphics and communications.

2. How many people will use the computer at one time? What business functions will each perform?

3. What are your plans for future applications or additional computer users? Will your initial system meet your needs for some time to come?

4. What is the estimated work load the computer will have to support? How many I/O transactions per day? How many orders shipped? How many checks or letters written? What response time do you expect?

5. What are the peaks and valleys of your normal business cycle? What work load would your heaviest seasons put on the computer?

6. What is your current business environment? How many customer accounts, shipping addresses, inventory items, products, parts, salesmen, vendors, general ledger accounts, open invoices and so forth will the computer support? Based on your projected business growth, what will these numbers be in the future?

7. What reports will you want from the computer? It's often a mistake simply to duplicate your manual reporting systems. Instead, you should ask what is the crucial information you need to improve your profits or to solve current problems.

8. What is your computer budget? To set a realistic figure, you should answer the above questions, read computer articles and advertisements and check capabilities and prices. Talk with other small-business computer users. Talk with computer sales representatives. With this self-knowledge and investigation, you will become an informed buyer.

Your specific answers to the above questions constitute a yardstick against which all small-business computer systems must be measured.

Your answers to Question 1 will eliminate many systems that simply do not have the kind of software you need. And, even those systems that claim to have this software may not satisfy the demands

(Continued on Page SR/36)

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But these advantages will require intensive disk access, and superior memory management. In simple language, disk access must be as fast as possible, and the disk must have an unusual capacity to maintain complex file systems on-line at all times.

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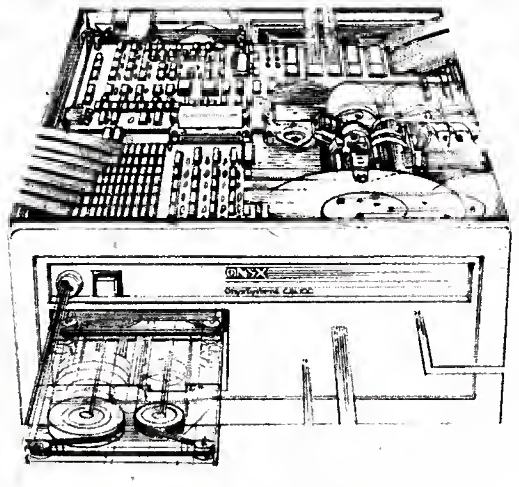
ONYX's IMI Winchester disk storage system, with its servo-driven voice coil head positioning, is more than twice as fast!

So, obviously the ONYX C8002 *will* do.

And, as developed, the ONYX C8002 features expandable memory up to 1 Mbyte, and disk storage up to 160 Mbytes on-line. Its cartridge tape backup offers cyclical redundancy checking on every backup. Both the Winchester disk storage system and the cartridge tape backup are *internal.*

Now it's 1982. The UNIX system's pre-eminence among 16-bit operating systems is established. And ONYX is the only company that has significant production experience with UNIX systems.



ONYX has installed over 1500 UNIX systems.

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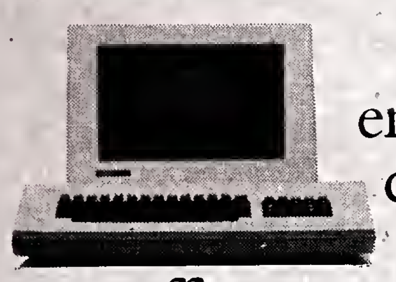

Mention office automation to most people, and they envision themselves drowning in a vast sea of expensive computers, terminals, processors and printers.

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It can easily manage the most unmanageable of jobs, like mind-boggling analyses and complex reports. And you'd be hard pressed to find another machine that can do it all as fast.

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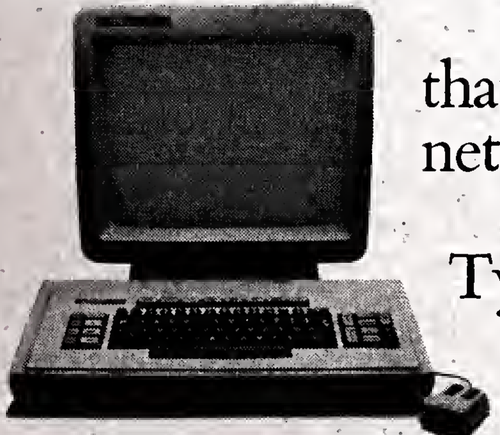

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Self-Analysis Key to Small Business Computing

(Continued from Page SR/33)

of a professional environment.

Consider, for example, word processing. Many under-$1,000 systems claim to handle WP. But few actually display 80 columns by 24 lines of text on a CRT screen. This is the standard for professional word processing. Other less expensive systems do not display lowercase letters.

Still others do not support enough central memory for professional word processing (64K bytes of central memory should be considered the minimum). And most under-$1,000 systems do not display easy-to-understand "menus" to help the business user.

Dig Under the Skin

Once you have narrowed your search to those systems that seem to support your application needs, dig under their skin to see if they can also support your unique business environment.

Can the computer support the number of CRT terminals you will need (based on your answers to Questions 2 and 3)? A very small business may only need a desktop computer, which supports a single terminal user.

Can the computer under consideration support the work loads you have defined in Questions 4 and 5?

Can the system support enough memory (both central and peripheral) to handle the business environment outlined by Questions 6 and 7? An OEM, salesman or experienced user can help you determine how much memory this environment will require.

Memory support is one area in which the "word size" of a CPU can have its greatest impact on your buying decision. Computers with 8-bit words, such as most personal computers, cannot support as much main memory as can 16-bit machines. The 16-bit machine's longer word length enables it to store more data, run more or larger programs and handle more sophisticated applications at higher speeds.

You may want to write your own customized software. But if you plan to program, be sure the computer you buy supports an appropriate language or languages.

Business Basic is an easy-to-learn, widely accepted language for first-time users. Cobol and interactive Cobol are ideal for programming business-reporting applications. Fortran was designed for applications that require less report formatting and more mathematical calculation.

Beyond programming languages, does the system under consideration provide for the other software capabilities you may need or want?

Next, make sure your computer's file or data base management software is compatible with your business environment and reporting requirements (as defined in Questions 6 and 7). If your records and reports are very simple, file management software may be sufficient.

Once you find a computer that seems to fill your application needs and can support your business environment, ask if it can keep up with your planned business growth. How many CRT terminal users can you add? How much main memory and disk storage? Can you add or change printers?

You should pay no more for a computer with a growth path. Such compatibility is largely a system design philosophy, which adds little to actual system cost, but which can protect your sizable investment in software, peripheral equipment and new business procedures.

Crawford is vice-president and general manager of Data General Corp.'s Small Business Systems Division.

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Node Allows Remote Access To SNA

WELLESLEY HILLS, Mass. — Paramin, Inc. has announced the release of its Systems Network Architecture (SNA) Network Services Facility (NSF). This communications node is said to enable the connection of various types of multiple interactive devices to multiple IBM hosts.

The NSF is operational on a Digital Equipment Corp. VAX-11/750. It appears as several 3274-51 controllers with emulated IBM 3278s and 3275s to the IBM host computers that operate in an SNA network. The NSF reportedly can communicate with Ascii terminals over asynchronous lines, with real and emulated 3275s over binary synchronous communications lines and with other NSFs in the network via DEC's Decnet interface.

Originally designed for use in the insurance industry, the NSF has been modified to offer the same capabilities to any company attempting to provide interactive access to SNA with remote non-SNA terminals, a vendor spokesman said.

License fee for the facility is $50,000 from Paramin, Inc., 31 Washington St., Wellesley Hills, Mass. 02181.

FCC Proposes Widening the Use Of Little-Used FM Subcarrier Band

By Bruce Hoard
CW Staff

WASHINGTON, D.C. — The Federal Communications Commission (FCC) has proposed expanding the use of a little-used FM radio band for such services as electronic mail.

The FCC expects to ask for comments in the near future on widening the use of the subsidiary channel authorization, or subcarrier band, as it is more commonly known.

One potential user of the expanded service is INC Telecommunications here, which represents the combined efforts of National Public Radio (NPR) and National Information Utilities Corp. The two have been anticipating the change and plan to offer news and data messages, among other services, on the "back" of NPR's main signal.

According to Stephen Dull, product manager for INC, expanded subcarrier programmimg will give each customer its own private network. The network will be functionally equivalent to a packet-switched network, he said.

Users will preassign the addresses of all locations where they want to send messages. "It restricts any given customer from sending mail to anyone else," he said. "It's not a public mail system."

Future Uses

In the future, users may be able to use personal computers to download software, and telephones may be used as an upstream link as part of a mail system similar to that provided by Compuserve, Inc.'s The Source, a large on-line data base provider. The user would type in a message, indicate its destination and the message would be routed to that particular person.

The subcarrier band permits a "piggyback" signal to be sent along with the main carrier signal, but on a different frequency, according to an FCC spokesman. "You can have two radio programs going on at the same time in a sense," he said.

Until now, however, use of the subcarrier band has been severely limited because it can interfere with main channel programming. Use of the band has been restricted to broadcast (point-to-multipoint) uses such as Muzak, the music pumped into department stores and dentists' offices.

The stores have a special receiver supplied to them by the originating radio station and they are the only parties that receive the transmission. "It's a specialized audience that they're directing it to," the spokesman said.

Other uses include a radio reading service for the visually impaired. That nonprofit service performs such functions as reading newspapers and novels to the listeners. A number of other companies send out business information in the form of stock information, which may be picked up in audio or video formats.

Currently, stereo FM radio stations are allowed only one subcarrier channel for voice.

The FCC is also contemplating expanding baseband offerings to include two subcarrier services instead of one. The baseband refers to the frequency band occupied by the total group of signals used to modulate the radio frequency carrier.

The spokesman said the proposed expansion of the subcarrier would not force radio stations into wholesale technical changes. The stations might need an additional piece of equipment, but it would be relatively inexpensive, he said.

Some receivers may have to be altered to deal with different frequencies. The FCC has engineers researching the situation now to determine whether there are other potential obstacles to opening up the subchannel.

Change Pressured

Pressure for the change has accumulated over a period of years, the FCC spokesman explained. The decision to push ahead was based on a general study of subcarrier band usage. "Most of the subcarrier is not being used and it has great potential for use for a variety of purposes," he said.

Dataspeed Inc. of Burlingame, Calif., is one vendor that is preparing to take advantage of the FCC proposal if and when it is implemented. A spokeswoman for that company said that by spring of next year, it will be selling a $90 pocket-size device capable of receiving stock market information.

Beyond that, the device will be upgraded to receive 500-word electronic documents by the end of 1983. The price for the enhanced version will fall somewhere around $250.

Codex Unveils Matrix Switch

MANSFIELD, Mass. — Codex Corp. has announced an electronic matrix switch said to allow large network users to cost-effectively automate testing and restoral at remote sites.

The IMS 7760 is a microprocessor-based matrix switch designed to extend the capabilities of traditional central site technical control. The restoral capabilities of the IMS allow users to reroute or swap out nodal processors, minicomputers, multiplexers, modems and the associate telephone lines, according to a spokesman.

Switching is executed electronically from the IMS control board, according to a Codex spokesman.

The switch further automates and expands this testing and restoral capability by allowing remote switching centers to be set up under the control of a central site. This reduces the requirement for technical or service personnel at remote sites for manual recabling, troubleshooting and other technical control functions, the spokesman said.

The switch is priced at $8,000.

Codex Corp. is based at 20 Cabot Blvd., Mansfield, Mass. 02048.

Emulate Sperry Univac UTS-20

Racal-Milgo Offers Stand-Alone Units

FORT LAUDERDALE, Fla. — Racal-Milgo, Inc. has introduced two stand-alone terminal systems that operate under the Bell 8A1 communications protocol and the vendor's Model 4220/UTS-20 Communications System. The 4220/UTS-20 emulates the Sperry Univac UTS-20 terminal.

Features of the Model 4015 terminal include a command mode which reportedly permits the host CPU or master terminal to downline load the date and time of day and to change supervisor security password. It can be programmed to automatically include the date and time of day on each message printed by supporting printer.

The Model 4220/UTS-20 is functionally compatible with Univac's U100, U200 and UTS-20 terminal systems. It offers such field control features as alphanumeric checking, automatic tabulation setting and a full page of right justification and a screen clear key, a vendor spokesman said.

The systems are priced at $4,155 and $3,370, respectively. More information can be obtained be contacting Racal-Milgo, Inc., Computer Products Division, 6250 N.W. 27th Way, Fort Lauderdale, Fla. 33309.

Avanti Announces Additions To 2300 Data Distributor Line

NEWPORT, R.I. — Avanti Computer Corp. has announced several additions to its family of 2300 local-area data distributors. The 2300 products will operate at speeds from 56K bit/sec to 2.5M bit/sec over metallic circuits or coaxial cable with a variety of digital interfaces.

For data rates at 56K bit/sec up to 460K bit/sec, Avanti is offering the 2335M, 2349M and the 2303M for use with V.35, RS-449/442 and Bell 301/303 interfaces, respectively.

For higher speed transmission at 461K bit/sec to 2.5M bit/sec, the 2335H and 2349H are offered for use with the V.35 and RS-449 interfaces. The units are available with up to four switch-selectable data rates within a specific range.

The 2300 line also features local-analog and remote-digital loopback diagnostics. Although the line was designed primarily to work as a point-to-point link between individual devices such as terminal equipment and CPUs, each product is available with an optional multipoint capability.

The 2335M sells for $1,825; the 2349M for $1,800; the 2303M for $2,025; the 2335H for $1,975; and the 2349H for $1,950.

Avanti Computer Corp. is at Aquidneck Industrial Park, Newport, R.I. 02840.

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Yet with all this moving up, there's very little moving out. For these systems are compatible and require a minimum of replacement.

Likewise, the application programs that run on the CS/5 run unchanged on the CS Series 100, on the CS Series 200 and on up through Data General's most sophisticated information systems.

So a business can use the same software as it goes from small to medium to large.

Without retraining its people. Or changing its methods.

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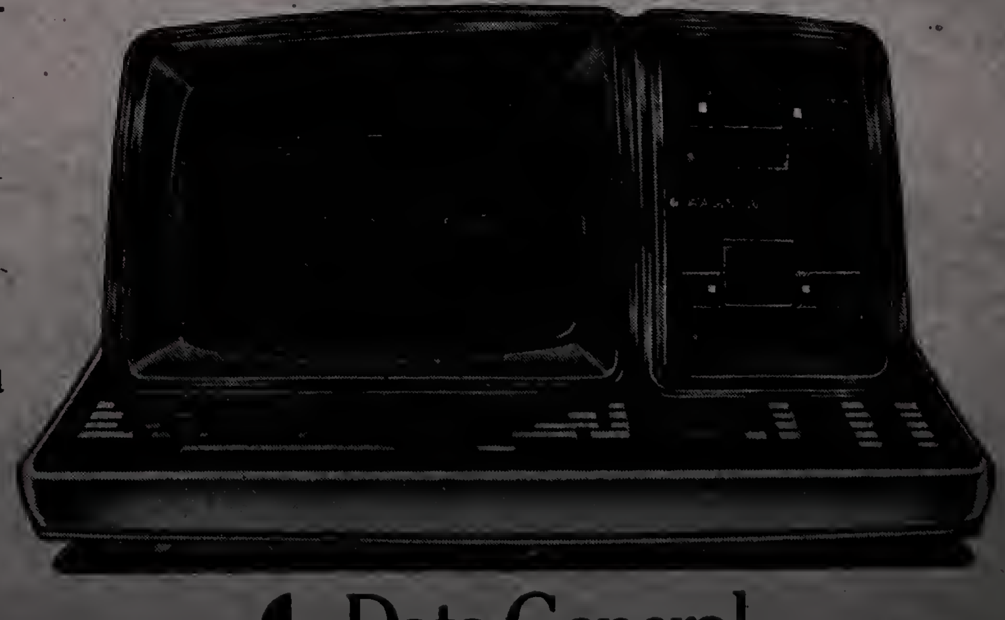
*On the CS/5 only BusiTEXT is currently available.



Data General

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Net Node Processor Designed for RS-232

OREM, Utah — Novell Data Systems, Inc. has introduced a node processor for a local-area network that is said to allow any RS-232 dumb terminal to act as a workstation using the Digital Research, Inc. CP/M operating system.

The Novell Node Processor is a self-contained, dual-purpose microcomputer that can function in either a standalone environment or as a node workstation in Novell's Local-Area Network. The workstation reportedly is Zilog, Inc. Z80-based with 64K bytes of memory. The node processor is available for between $1,500 and $1,700.

Also available from the vendor is a local-area network that allows 24 users of the IBM Personal Computer to share common printers and disk drives. This network is available for $7,500.

More information is available from Novell Data Systems, Inc., 1170 N. Industrial Park Drive, Orem, Utah 84057.

Protocol Converter Connects Retailers

DAYTON, Ohio — Monarch Marketing Systems, Inc. has introduced a protocol converter that is said to allow communications with a range of computers, enabling retailers to integrate on-line ticketing with point-of-receipt and purchase order management.

Other benefits include a remote hookup over telephone lines, entered batches or print runs that can be prioritized and tags that are individually cut and batch-separated to save the extra step of tearing wide-web computer forms into single tags.

The converter is available for $6,000 from Monarch Marketing Systems, Inc., P.O. Box 608, Dayton, Ohio 45401.

Remote Net Nodes Get Matrix Switch

FRAMINGHAM, Mass. — Bytex Corp. has unveiled a matrix switch for deployment at remote network nodes that reportedly supports up to 112 combined digital and analog ports.

Autoswitch 100 prices start at $5,950.

Along with the new model, the firm announced networking software said to support the remote interconnection of up to 255 Autoswitch units. A multilevel password scheme permits distributed control of a network or allows the network to be controlled from a central site, a spokesman claimed.

The networking capability costs $1,750 per node, including all hardware and software, the Bytex spokesman said from 2 California Ave., Framingham, Mass. 01701.

Data Bits

Protocol Converter Emulates Burroughs

EAST GREENWICH, R.I. — Datagram Corp. has announced an enhancement for its DM1600B protocol converter and concentrator. The new feature, called Poll Ahead, is said to allow the converter to act like a remote front end for Burroughs Corp. equipment using poll/select protocol.

It will also reduce the host system polling overhead, allowing users to install more terminals on one line adaptor and can support a mix of Burroughs and asynchronous Ascii terminals.

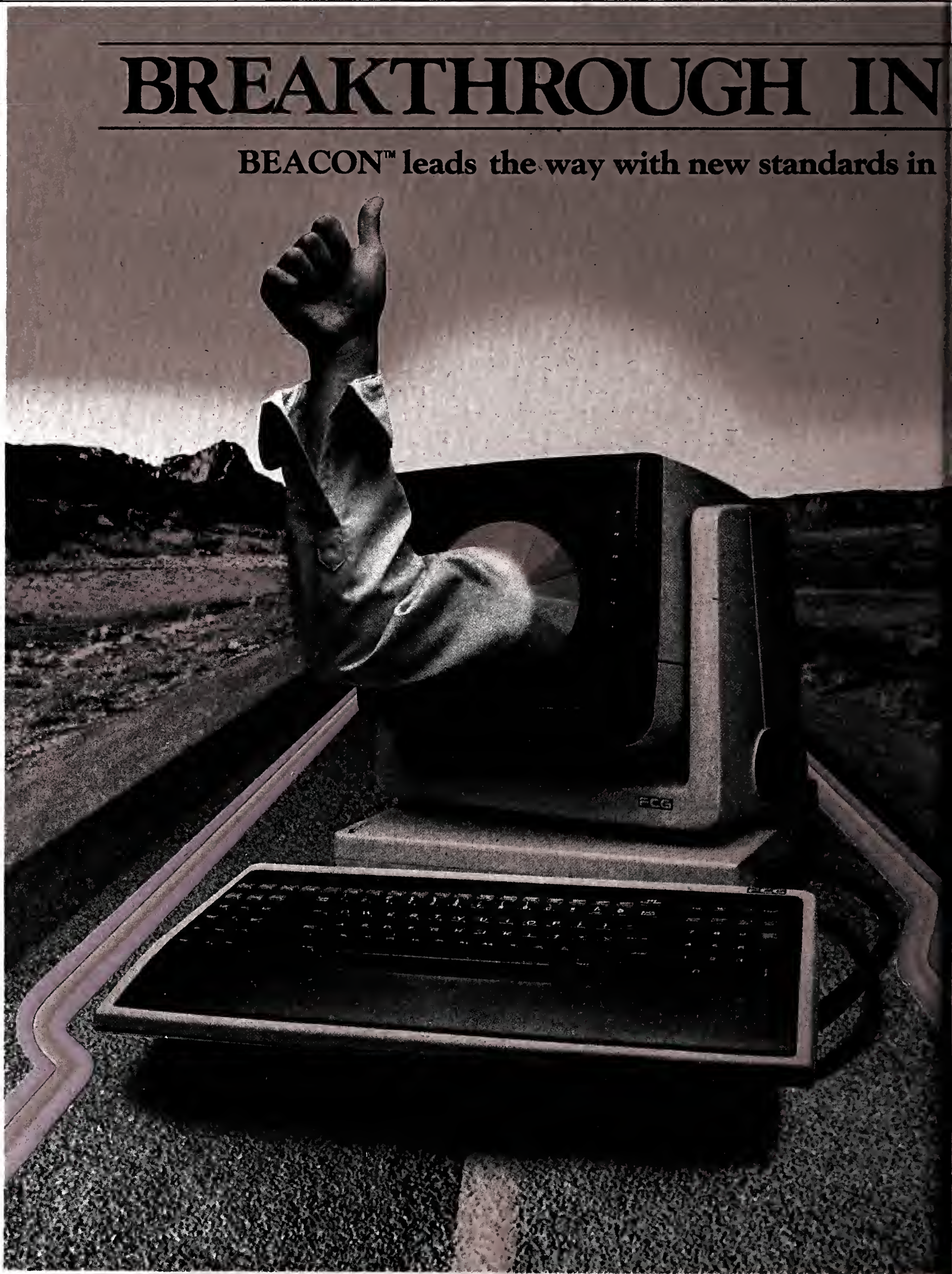
The enhancement is offered at no charge to users of the DM1600B, which ranges in price from $5,700 to $17,000. More information is available from Datagram Corp., 11 Main St., East Greenwich, R.I. 02818.

Develcon Dataswitch Boosts On-Site Nets

DOYLESTOWN, Pa. — Develcon Electronics, Inc. has announced an addition to its Dataswitch line of intelligent switching systems for on-site data communications networks that is said to give a range of choices in prices and capabilities.

The 9001 Dataswitch handles up to 284 subscribers and offers features of prioritized queuing, automatic record keeping and systems security passwords and automatic recording of all systems statistics for management guidance. The 9001 operates in asynchronous mode only, the vendor said.

The 9001 is available for $5,000 from Develcon Electronics, Inc., 4037 Swamp Road, Doylestown, Pa. 18901.



Icot 352 Lets Six Ascii Types Emulate IBM 3270s

MOUNTAIN VIEW, Calif. — Icot Corp. has introduced a virtual terminal system that is said to allow up to six different types of Ascii terminals or personal computers to emulate the IBM 3270 terminals.

The Icot 352 uses IBM binary sycnhronous communications and IBM 3271 Synchronous Data Link Control protocols at speeds up to 19.2K bit/sec. It reportedly allows six users to be on-line to two applications simultaneously.

Each user can switch back and forth between applications without logging off either session, a vendor spokesman said.

The terminal system sells for $5,800 from Icot Corp., 830 Maud Ave., Mountain View, Calif. 94043.

Graphics Capabilities

Memorex Terminal Boasts Color

SANTA CLARA, Calif. — Memorex Corp. has introduced a color CRT terminal with graphics capabilities that reportedly accommodates seven colors, alphanumeric data and business graphics.

The 2079 Color Display Station has a screen capacity of 1,920 characters and a separate keyboard. Compatible in IBM Systems Network Architecture/Synchronous Data Link Control or binary synchronous communications environments, it allows operators to enter alphanumeric data and special APL and text characters to retrieve that data in alphanumeric and graphics form from a number of IBM and Amdahl Corp. processors.

The price of the terminal begins at $4,395.

Memorex is at San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Informer Cuts Prices

LOS ANGELES — Informer Computer Terminals, Inc. has cut prices up to 50% on its 401 and 304 families of terminals.

The price reductions reportedly reflect the terminals' circuit design improvements. The asynchronous D304 and I304 sell for $1,650 and $1,800, respectively, and the 401 costs $690.

The terminals feature tilt and swivel screens, 128 characters, character and block modes and green phosphor CRT screens, a spokesman said from 8332 Osage Ave., Los Angeles, Calif. 90045.

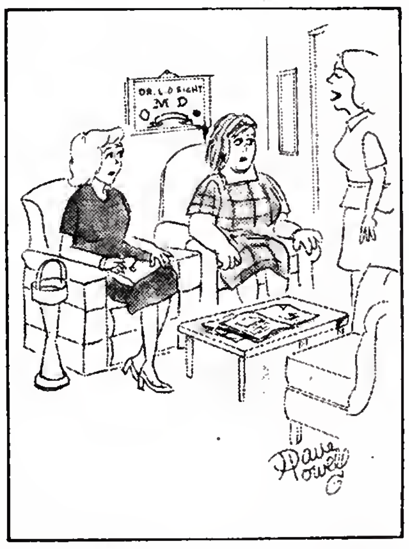
Ven-Tel Modem Cuts Line On Command

SANTA CLARA, Calif. — Ven-Tel, Inc. has introduced a Bell 212A-compatible modem that will disconnect from the telephone line whenever it detects a user-definable character string.

The MD212 Plus II includes an integral serial autodialer that supports both keyboard and computer dialing, stored-number dialing, repeat dialing and automatic redial.

A character string of up to eight characters including control and escape characters may be specified by the user. The disconnect command string may be initiated by either the local or remote equipment. When the modem detects the disconnect command string, it automatically disconnects the telephone line connection.

The stand-alone version of the modem costs $1,245; the card modem costs $1,175 from Ven-Tel, Inc., 2342 Walsh Ave, Santa Clara, Calif. 95051.



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The Beacon™ System displays a full spectrum of graphics capabilities. Not only multi-color graphs and charts, but engineering diagrams, as well.

As a stand-alone or host-dependent system, Beacon does it all. For enhanced productivity in engineering, marketing, manufacturing, and financial control.

More power where it's needed.

The Beacon System can accommodate up to almost 1 MByte of main processing memory. With the addition of 640 KB of graphics memory, Beacon can create a 1280 x 960 image resolution used in many CAD/CAM applications. This high resolution, combined with standard zoom and roam features on a 13" or 19" display, make Beacon ideal for engineering applications. Beacon's own menu driven software and CP/M compatible operating system provide access to a comprehensive library of programs that cover virtually every aspect of business.

Superior graphics features.

The extent and caliber of Beacon's graphics features is unmatched in its price range.

The System's brighter, more vivid colors stem from a unique electronic design and a superior raster scan display. The BeaconBRIGHT™ image, combined with an anti-glare filter eliminates the need for hooding the display—even in brightly lit areas.

Circles, vectors, arcs, rectangles and polygon fills are generated with hardware rather than software. As a result, image response is almost instantaneous.

Beacon's 16x zoom feature can be controlled from the keyboard in 1x increments. Both horizontal and vertical scrolling is variable in speed and exceptionally smooth. Beacon also provides reverse video and underline, as well as blinking and variable height characters.

Other graphics features include: 640 x 480 resolution (standard); 6 memory planes with 256 colors—up to 32 usable at a time (16 in the graphics plane and 16 in the alpha numeric plane)—and 18 programmable function keys on the keyboard and another 18 on the display bezel.

Human-factors engineering.

The human factors, or ergonomics, that make a computer personally comfortable played an integral part in the Beacon System's design.

The critical area of reducing eye strain and fatigue has been accommodated through the development of a screen image *twice as steady* as the image in other computer systems, including those that are advertised as "flicker free." For extra visual comfort, the brightness of the Beacon image is controllable at the keyboard, and an anti-glare filter reduces distracting reflections.

And Beacon's commitment to superior ergonomic design doesn't stop there. To avoid back strain, the monitor tilts, swivels, and uniquely adjusts 5.5" in height. In addition, the keyboard is separate from the display and can, therefore, eliminate the sense of being tied down to the monitor.

Other hands-on features that make for greater comfort and productivity are: a three-degree adjustable tilt in the keyboard, a palm rest, tactile feedback, sculptured keys, and a dimpled home key in the function and numerical key clusters.

The importance of MPA.

Our MPA, or Multiple Processor Architecture, is unique to the Beacon System. It incorporates six individual microprocessors, each chosen for its efficiency in the performance of specific tasks.

System throughput is optimized with the use of an administrative processor which distributes Beacon's internal workload. A 16-bit bit-slice processor is dedicated solely to graphics tasks and mathematical functions.

MPA is at the heart of Beacon's extraordinary performance.

Quality and service assured.

All equipment is constantly monitored and evaluated from our corporate production facility, utilizing the most sophisticated automated test equipment available today. And our systems are supported by three levels of service, assuring you of minimal downtime.

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The recently introduced "Sybercache" intelligent disk controller anticipates CPU requirements, fetches needed information, and is prepared to supply data as it is requested.

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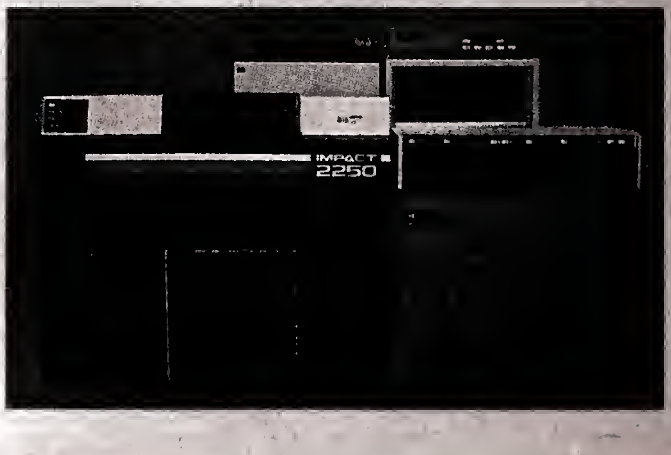


Storage Technology Corporation

For General-Purpose Computers

Array Processor Matches Cray-1 Speed

PORTLAND, Ore. — Star Technologies, Inc. has unveiled an array processor that can be attached to a variety of mid-size and mainframe computers and reportedly can boost their performance to the 100 million floating-point instructions per second range — the same theoretical speed range of Cray Research, Inc.'s Cray I supercomputer.

Like conventional array processors, the ST-100 attaches to general-purpose computers to provide high-speed arithmetic operations. This device, however, is said to offer 10 times the computational speeds offered by presently available array processors. It was designed for use with computers from Control Data Corp., Perkin-Elmer Corp., Systems Engineering Laboratories, Inc., Digital Equipment Corp. and IBM, a spokesman for the vendor said.

The ST-100 features multiple programming internal processors, multiple arithmetic units and high-speed logic circuitry. A "hardware divide" among the arithmetic units reportedly makes the machine appropriate for simulation, as well as other scientific applications.

System Configurations

The system has a master control processor and three independent processors, which handle not only the high-speed arithmetic and logic units, but also the simultaneous input and output of data and the staging of operations as well, the spokesman noted.

The ST-100 incorporates 64K-bit random-access memory chips and presently has up to 8 million 32-bit words of main memory. Applications library modules are provided for basic vector and matrix operations, he added.

The basic ST-100 consists of 512K words of memory and a 48K-word data cache and costs $250,000. The price includes operating and development software, interface and installation. Deliveries are scheduled for the first quarter of 1983.

Star can be reached at Suite 1212, One S.W. Columbia, Portland, Ore. 97258.

Tool Ups Power of Array-Based Systems

PORTLAND, Ore. — Aptec Computer Systems, Inc. has introduced a system-building tool said to allow users of array processors to construct systems that are two to 10 times more powerful than their present system limits.

The Dimensional Processing System (DPS)-2400 reportedly allows users to build systems that utilize from two to eight array processors on a single host. It was designed to operate with array processors like those offered by Floating Point Systems, Inc.

The system consists of three basic hardware elements: peripheral device adapters, an internal bus structure and mass memory. The DPS-2400 is said to offer:

- Programmable control outside the host for most array processor data transfer operations.
- A high-speed bus for data transfers between memory, array processors, peripheral devices and the host.
- A large high-speed memory that is accessible to all DPS devices and the host.
- Extensive support software to assist application development and system integration.

Backbone of System

The backbone of the system is the Data Interchange Bus (DIB), a high-performance bus with full duplex data lines and separate address lines. DIB reportedly has a bandwidth of 24M byte/sec and is capable of supporting the simultaneous I/O of up to eight array processors, each transferring at their maximum 3M byte/sec rate.

Intelligent, microprocessor-based device interchange adapters (DIA) interface the DPS to the host, and the array processors, peripherals and other attached devices to the DPS. DIAs are said to be fully programmable computers that serve as dedicated "hosts" for each device in the DPS subsystem. DIAs assume control of the overhead that would otherwise be handled by the CPU host, a spokesman said.

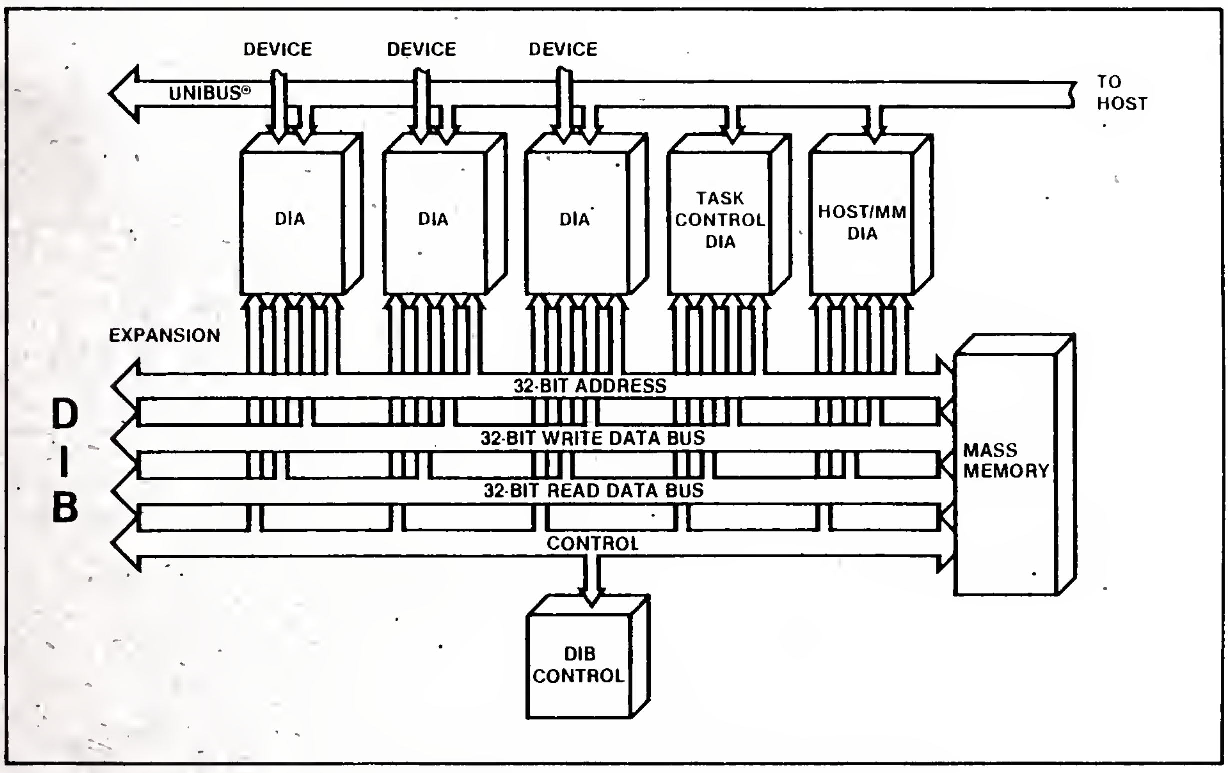
Under the control of the host DIAs, devices attached to the DPS may be individually switched to either the DIB or a host Intel Corp. Unibus. This provides an additional data path between devices and software-transparent access to each DPS device by the host, the vendor said.

The unit's 32-bit mass memory can be expanded up to 24M bytes and has a memory access time of 333 nsecs. Addressing can be done on 8-, 16- or 32-bit boundaries.

The DPS-2400 reportedly includes a software package called Staple (structured application language and executive), which features a structured C-like language for development of application routines, full compatibility with Floating Point System's Mathlib and user-written microcode and a complete software interface for full host Fortran access.

The DPS-2400 with 2M bytes of memory and DIAs for the host, two array processors and two peripheral devices costs about $65,000. The DIAs are priced at $6,500 each and memory costs $9,500 per 1M-byte memory board.

Aptec is located at 10180 S.W. Nimbus Ave., Portland, Ore. 97223.



Aptec Dimensional Processing System

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Memory, Peripherals

Gould's SEL Cuts Prices

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division has announced price cuts on memory and peripherals for its 32-bit Concept 32/8780 processor.

Memory prices have been cut by as much as 23% for some Integrated Memory Modules (IMM). The IMM is available in 256K-, 512K- and 1M-byte module densities, includes a memory bus controller, error-correction code and refresh logic. The new prices for single 256K-, 512K- and 1M-byte IMMs are $7,000, $9,000 and $14,000, respectively. Packages of two, three or four IMMs are also available, at a discount, the vendor said.

Price reductions of up to 25% were announced for 80M-, 300M- and 600M-byte disk drive units and disk subsystems. The 600M-byte disk processor subsystem now costs $47,000, the vendor said.

Tape transports and tape subsystems, including 45-, 75- and 125 in./sec types were cut by as much as 18%. A 125 in./sec, tri-density add-on tape transport now costs $22,000, the vendor said.

New prices are effective immediately, the vendor said from 6901 W. Sunrise Blvd. P.O. Box 9148, Fort Lauderdale, Fla. 33310.

Xylogics CPU Gets 22-Bit Addressing

BURLINGTON, Mass. — Xylogics, Inc. has announced it is offering full 22-bit addressing capability on its 550 emulating peripheral processor in conjunction with several new disk-drive emulations.

The 550 is a Q-bus-compatible storage module disk (SMD) controller that reportedly has the capability of emulating Digital Equipment Corp.'s RK06/RK07 and RM02/RM05 subsystems with no modifications to the operating system software. The 22-bit addressing feature is said to allow direct memory access functionality with up to 4M bytes of main memory and a total disk storage of over 2.5G bytes.

The new features provide wider flexibility in configuring systems since different size drives may be used with any standard emulation, the spokesman said.

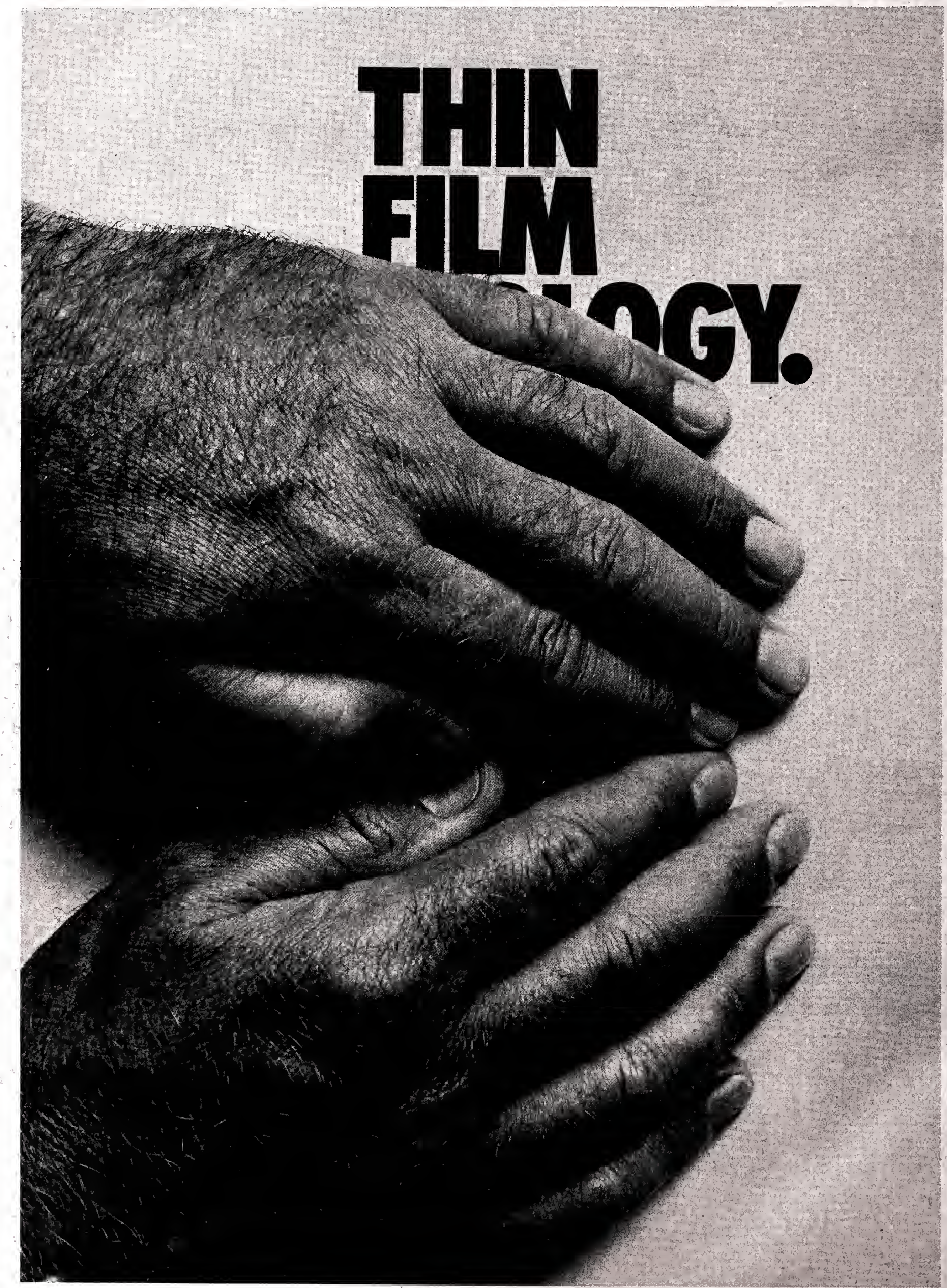
The 550 sells for $2,950 in single quantities and under $2,000 in OEM and distributor quantities from the firm at 144 Middlesex Tnpk., Burlington, Mass. 01803.

Turnkey Aids Civil Design

KANSAS CITY, Mo. — United Information Services, Inc. (UIS) has unveiled a computer-aided design turnkey said to automate the civil design process.

Civil/Designer II (C/D II) is said to combine hardware with a fully integrated engineering software application to reduce the time required to create plans.

A standard configuration with twin workstation costs $270,000, with rental terms available from UIS, 2525 Washington St., Kansas City, Mo. 64108.



Mini Bits

Winchester Mini System Bows, Based on PDP-11/23-Plus CPU

WESTMONT, Ill. — A Winchester minicomputer system based on the Digital Equipment Corp. PDP-11/23-Plus processor has been unveiled by First Computer Corp.

The 11/23-Plus Winchester System has 256K bytes of MOS memory, two serial lines and a choice of terminals. Data storage is provided by a 160M-byte fixed Winchester disk and an 80M-byte removable cartridge disk.

Choice of operating systems includes DEC RT-11, RSX11-M or Bell Laboratories's Unix. The system sells for under $30,000, a spokesman said from 645 Blackhawk Drive, Westmont, Ill. 60559.

Storage Size of DEC Transports Boosted by ¼-In. Tape Controller

GARDEN GROVE, Calif. — A tape controller said to mate ¼-in. cartridge tape transports with Digital Equipment Corp. LSI-11; LSI-11/2 or LSI-11/23 microcomputers to give eight times the storage capacity of DEC transports is available from Distributed Logic Corp.

The Model DQ320 interfaces with the Data Electronics, Inc. Model 3400 Funnel and Funnel interface-compatible transports from Electronic Peripherals, Inc.

The controller costs $1,695 from 12800 Garden Grove Blvd., Garden Grove, Calif. 92643.

Multibus-Compatible Controller Handles Eight Ansi Winnie Drives

PLYMOUTH, Minn. — An intelligent Intel Corp. Multibus-compatible controller capable of handling up to eight Ansi Winchester disk drives and up to four ¼-in. cartridge tape drives has been announced by Computer Products Corp.

The Rimfire 75 controller features direct-memory-access operation with 24-bit addressing and a separate 32-bit error-correction code word on each sector ID and data block, a spokesman s

The unit costs $2,145 from the firm at Suite 250, 2405 Annapolis Lane, Plymouth, Minn. 55441.

'Microstreamer II' Backs Basic Four's System 810 Mini

SAN DIEGO — Cipher Data Products, Inc. has announced an updated version of its Microstreamer ½-in. streaming tape drive said to back up Basic Four Corp.'s Information Systems Division's high-end System 810 minicomputer.

The System 810 was designed for a multitasking business environment and reportedly can support up to 64 users simultaneously. Microstreamer I, at 1,600 bit/in., costs $4,000 and Microstreamer II, at 3,200 bit/in., costs $4,375 from the vendor at 10225 Willow Creek Road, P.O. Box 85170, San Diego, Calif. 92138.

Interface Makes S-100 Signals For Z80A-Based Computers

SILVER SPRING, Md. — Kramer Systems International, Inc. (KSI) has introduced an interface said to allow any Zilog, Inc. Z80A-based computer to directly control devices connected to an S-100 bus.

The KSI S-100 Interface reportedly supports byte-wide processing on the S-100 Bus and generates the majority of S-100 signals required by IEEE S-100 Bus Standard Specification 696.

The KSI S-100 costs $600 from Kramer, 8403 Dixon Ave., Silver Spring, Md. 20910.

MDS Qantel Business Line Adds Mid-Size Processor

HAYWARD, Calif. — MDS Qantel, Inc. has added a mid-size computer to its business system series that features a processor said to be up to five times faster than the CPU in the firm's existing machines, including the firm's recently introduced 64-bit minicomputer.

The System 40 joins the firm's entry-level System 20 and high-end System 64 and is primarily aimed at vertical marketplaces. For example, the system can be purchased with Qantel applications packages targeted for the manufacturing, professional sports, distribution and other markets, a spokesman explained.

A typical configuration of the minicomputer consists of a CPU that incorporates 64K-bit chip technology, 256K bytes of main memory, a communications controller for remote applications and on-line diagnostics, a 300 line/min printer, five CRT terminals, a 150M-byte disk drive and a 45 in./sec magnetic tape drive. The System 40 is fully compatible with the company's existing hardware and software. It also has increased ability for multiterminal applications and can tie into Qantel's Best/Net local-area network, the company claimed.

Other improvements and benefits of the system include a time-efficient file backup system and an increased capability for multiterminal applications

The System 40's base price begins at $99,000 with first shipments slated for the fourth quarter.

More information is available from Qantel Business Computers, 4142 Point Eden Way, Hayward, Calif. 04545.

'Super-Slave' Fits S-100 Bus Board, Offers Z80A CPU

GARDEN GROVE, Calif. — Advanced Microdigital Corp. has announced the Super-Slave processor, which provides a dedicated Zilog, Inc. Z80A CPU for every user, reportedly without putting limitations on system size.

Designed to fit an S-100 Bus motherboard, the Super-Slave includes a Z80A CPU, four serial and two parallel I/O ports, 2K bytes of erasable programmable read-only memory (expandable to 4K bytes) and 64K bytes of bank-switched random-access memory (expandable to 128K bytes). The board shares data with its host only when accessing the drives.

Super-Slave costs $650, including documentation and a one-year warranty from the firm at 12700 B Knott Ave., Garden Grove, Calif. 92641.

Honeywell Unveils Business System From Datanetwork

MINNEAPOLIS — Ultramate, a business management information system designed for specific industry users, was unveiled here by Honeywell, Inc.'s Datanetwork organization.

The system includes a Zilog, Inc. Z80 microprocessor-based unit, a set of financial application software (accounts receivable, sales order processing, inventory, general ledger and accounts payable), a package of software programs and data bases designed for the target market segments and network access to Honeywell's Datanetwork large-scale processing system and customer service center, the vendor explained.

User support will be provided on demand through a feature called Helpmate, which is designed to provide a two-way communications service. By pushing the Helpmate key on the system console, the operator will be linked with a Datanetwork customer-service representative who can remotely monitor all operator actions and provide assistance. Also through Helpmate, the Ultramate system offers access to a library of business programs and data base information.

The one-time cost for the processor, the financial software and availability of the Datanetwork products and services is $19,000. Access to the Datanetwork itself is charged on a usage basis, the vendor said from Honeywell Plaza, Minneapolis, Minn. 55408.

ECI Reduces Prices, Adds Capabilities To HP's 9845 Micro

NEW YORK — Eventide Clockworks, Inc. (ECI) has announced increased capabilities for Hewlett-Packard Co. 9845 desktop computers and a price reduction for Eventide Wmaz memory boards.

Command file processing has been added to the Eventide Wmaz high-density memory boards for the HP 9845 series, reportedly increasing programmer productivity and computer efficiency by allowing users to submit a series of commands that are automatically executed whenever the computer either requests a user input or becomes idle after running a program.

The program is supplied as a pair of 32K erasable programmable read-only memories that plug into Eventide's Wmaz-4 quad-density memory board for all versions of the 9845.

Price reductions for the Wmaz boards include the following: The 512K-byte Wmaz-4 has been reduced to $3500 from $4500, and the price for the 256K-byte Wmaz-4(2) is now $2750 from $3250.

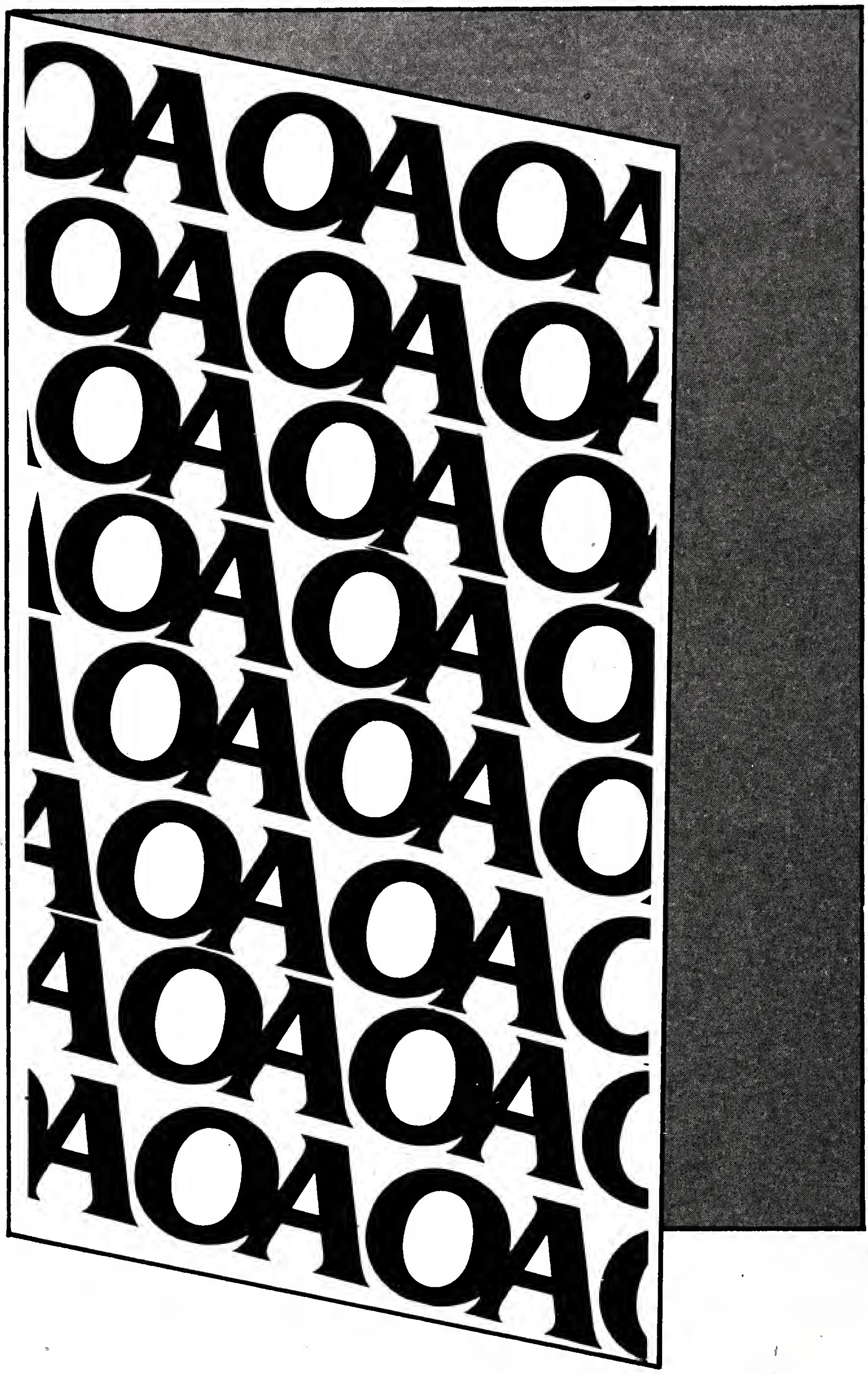
ECI is located at 265 W. 54th St., New York, N.Y. 10019.

TI Reduces Prices On Memory Boards

DALLAS — Texas Instruments, Inc. has announced an average 20% price reduction for add-in memory boards for Digital Equipment Corp. LSI-11 and PDP-11 series processors as well as Intel Corp. ISBC/Multibus systems. Price changes include:

- A 128K-byte add-in memory for an LSI-11 processor, which formerly cost $810, now costs $786.
- A 512K-byte memory enhancement for DEC PDP-11 processors formerly cost $2,995; it now costs $2,689.
- A 512K-byte enhancement for ISBC/Multibus processors, which formerly cost $3,195, is now priced at $2,443.

TI can be reached through P.O. Box 202129, Dallas, Texas 75220.



Coming up in *Computerworld OA*

Selling Office Automation to Your Organization

The next issue of *Computerworld OA* will focus on selling office automation within an organization. This special report will feature the human angle of office automation and highlight the strategies of selling the concept of OA to top management and end-users in an organization. You'll see articles on implementation techniques, feasability studies, human interface, ergonomics and productivity.

And, of course, you'll see several articles on current happenings in all aspects of OA.

There will be bonus distribution of this issue to attendees of the Info '82 Show in New York this October.

The issue date is September 29th.

For more details on *Computerworld OA* and the people who read it, just contact your local *Computerworld* representative, or call Bob Ziegel, Vice President at (617) 879-0700 for all the information.

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Pizzeria Uses WP System To Slice Payroll Costs, Write Financial Reports

Special to CW

PETALUMA, Calif. — Pizza restauranteurs Pete Singler and Richard Ernster are using a word processing system that saves them $2,000 a year by quickly preparing financial statements and operating reports while cutting payroll-check writing time from one day to 20 minutes a week.

The two are co-owners of 16 Round Table Pizza restaurants.

"We've been able to get our reports by the 15th instead of the 20th of each month," noted Ernster, president of Singler Enterprises here. "This enables us to keep a closer watch over our food and labor costs to ensure that they are at the proper levels."

Savings of $2,000

"What's more, we've done this while adding five new Round Table stores and without having to hire extra bookkeeping help. In the first year alone, we eliminated $2,000 in outside accounting fees to process W-2 forms for some 400 employees. And the savings will be even greater this year," he said.

Ernster first became acquainted with the Digital Equipment Corp. WS78 minicomputer-based word processing system in late 1979, when he went to DEC's retail computer store in San Francisco to learn more about the system. He was unable to find a comparable system anywhere near the same price — just under $13,000 including a WS78 video display, an LA120 120-char./sec draft printer, a dual-disk storage system and prepackaged software for payroll and general ledger.

"Before acquiring the system, it took about a day each week just to calculate manually and write the checks for some 140 employees, including 40 permanent employees in nine stores. The system can print the same number of checks in about 20 minutes, leaving me free to do other work,"said employee Judy Kenna.

On Monday afternoon and Tuesday morning of each week, Kenna receives the payroll schedules from each of the nine Round Table stores located in Northern California. These schedules include employee names, regular hours worked each day, overtime hours, gross wages, exemptions, tax, disability and other information.

Checks for the stores in Southern California are written manually by office management there.

Once Kenna determines that the schedule is accurate, she enters the employee number in the system. The system automatically retrieves a master file maintenance list, stored on a small phonograph-record-size disk that can be loaded into the system, and displays the employee's name on the system's video screen.

The master file includes employee pay rates and overtime rates, withholding information, social security numbers and addresses.

Next, she types in a code corresponding to whether the person is a salaried or an hourly employee. There are also codes for overtime, split-shift and other pay schedules. She then enters the number of hours worked, and the computer automatically calculates the gross pay. Once information for all employees in a particular store is entered, the WS78 computes the gross total against the weekly schedule to check for accuracy.

The Round Table Pizza restaurants (above) have sliced expenses with a word processing system (below).

Frequency of Deductions

The frequency of deductions is then entered and the system prints the current withholding, gross, net, year-to-date gross and year-to-date withholding. The WS78 then produces an attendance register, which includes employee number; name; rate of pay; number of regular, overtime, vacation and sick pay hours; and gross totals for each category.

Next, Kenna mounts the payroll check on the printer and enters the pay date and starting employee and check number into the video terminal. Before actually printing the checks, however, the system produces a dummy check to insure proper positioning of data.

After printing the checks, regular paper is installed and the WS78 prints the distribution report. This report, which shows the gross payroll by store, is broken down into regular pay, overtime, vacation, holidays, number of entries, total hours and total gross. These figures should now agree with each store's schedule. The system then prints the check register, which includes employee number, name, check amount and check number.

Kenna updates the payroll files on disk and transfers them to another disk to ensure that the information is not lost should anything happen to the first. The general manager then delivers the checks to the nine stores in Northern California.

Soap Forms To Promote OA Profession

RIDGEFIELD, Conn. — The Society of Office Automation Professionals (Soap) has been formed as a nonprofit organization, the group's board of directors announced.

The society was established to promote office automation as a profession, encourage standards of professional excellence, facilitate communications throughout the office automation community and promote research, standards and public policy, the organization said.

Soap activities include a periodic newsletter with articles, abstracts and conference information.

Annual dues for the society are $50. Corporate memberships cover up to five individuals and cost $250. Additional corporate memberships cost $40. For more information about the organization, contact N. Dean Meyer, 233 Mountain Road, Ridgefield, Conn. 06877.

Systems Integration the Theme

IWP Symposium Slated Nov. 9-11

PHOENIX — "Integrated Business Systems" is the theme of the International Information/Word Processing Association's (IWP) fall symposium, which will take place here Nov. 9-11.

Four functional tracks will cover information systems development, interpersonal effectiveness, technology of systems integration and systems integration management.

More than 30 sessions will be held on such topics as integrated office technology, local-area networks, integration of storage and retrieval systems, automated business graphics and electronic mail.

The registration fee for IWP members is $225; nonmembers will be charged $300. The IWP is headquartered at 1015 N. York Road, Willow Grove, Pa. 19090.

Canadian IWP Meet Set Nov. 30

MONTREAL — The 1982 Canadian symposium of the International Information/Word Processing Association (IWP) will take place here Nov. 30 through Dec. 2.

Sessions at this event will be aimed at office automation professionals and will be conducted in both English and French.

A manufacturers' exhibit will run concurrently with the conference.

Registration for the conference and exhibit costs $250 for IWP members, $300 for nonmembers. Further details can be obtained from IWP Conference Services, 1015 N. York Road, Willow Grove, Pa. 19090.

9 to 5 Releases Health, Safety Guide to WP

BOSTON — The Organization for Women Office Workers — 9 to 5 — has released a consumer guide to word processors said to compare and highlight the health and safety features of various models. "The Human Factor" also includes recommendations to employers, government officials and manufacturers of automated office equipment.

Among the word processing equipment reviewed are systems made by IBM, Digital Equipment Corp., Wang Laboratories, Inc., Honeywell, Inc. and Prime Computer, Inc.

Recommendations to employers include providing regular employer-paid eye exams for all operators, granting frequent rest breaks as recommended by the National Institute for Occupational Safety and Health and allowing women who choose to become pregnant and other operators the choice of a transfer to a non-CRT terminal work environment with no loss of pay.

Removing Unsafe CRTs

The group also recommends that manufacturers upgrade low-quality equipment and remove unsafe models of CRT terminals and other word processing equipment from the market. "I think it's time that office workers in the U.S. were able to work with the same first-rate equipment that our European sisters presently use," Diane Barry, chairwoman of 9 to 5's health and safety committee said.

National studies show that clerical workers using automated equipment experience more health problems than clericals who do not use the equipment, an organization spokeswoman said. One third of today's 42 million working women are clerical workers and the number of those using word processors daily is growing rapidly.

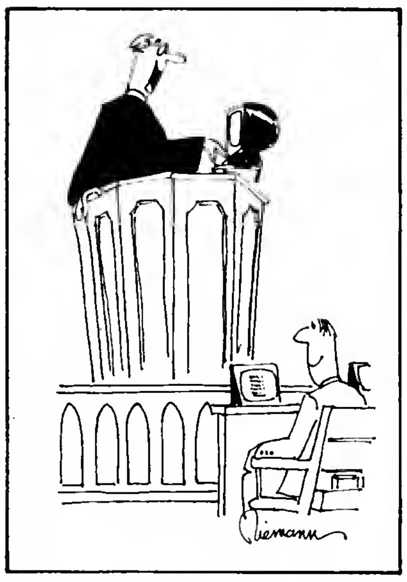
A copy of the guide costs $5 for institutions and $1.50 for individuals. It can be obtained by contacting the Organization for Women Office Workers, 140 Clarendon St., Boston, Mass. 02116.

Slide Show Out On WP

WILLOW GROVE, Pa. — "Word Processing Careers: Getting Started" is the title of a recently produced slide presentation from the International Information/Word Processing Association (IWP).

The nine-minute audio-visual program is intended for students, people reentering the work force and those considering a career change to information processing. It reportedly details a word processor's job responsibilities and highlights opportunities in the industry. Some of the areas covered in the film are basic word processing concepts, required skills, avenues of training and a look at typical operator's day.

The slide show is available for $129.95, which includes slides and carousel, operating instructions, 50 illustrated pamphlets and an audio cassette. Further details are available from IWP at 1015 N. York Road, Willow Grove, Pa. 19090.



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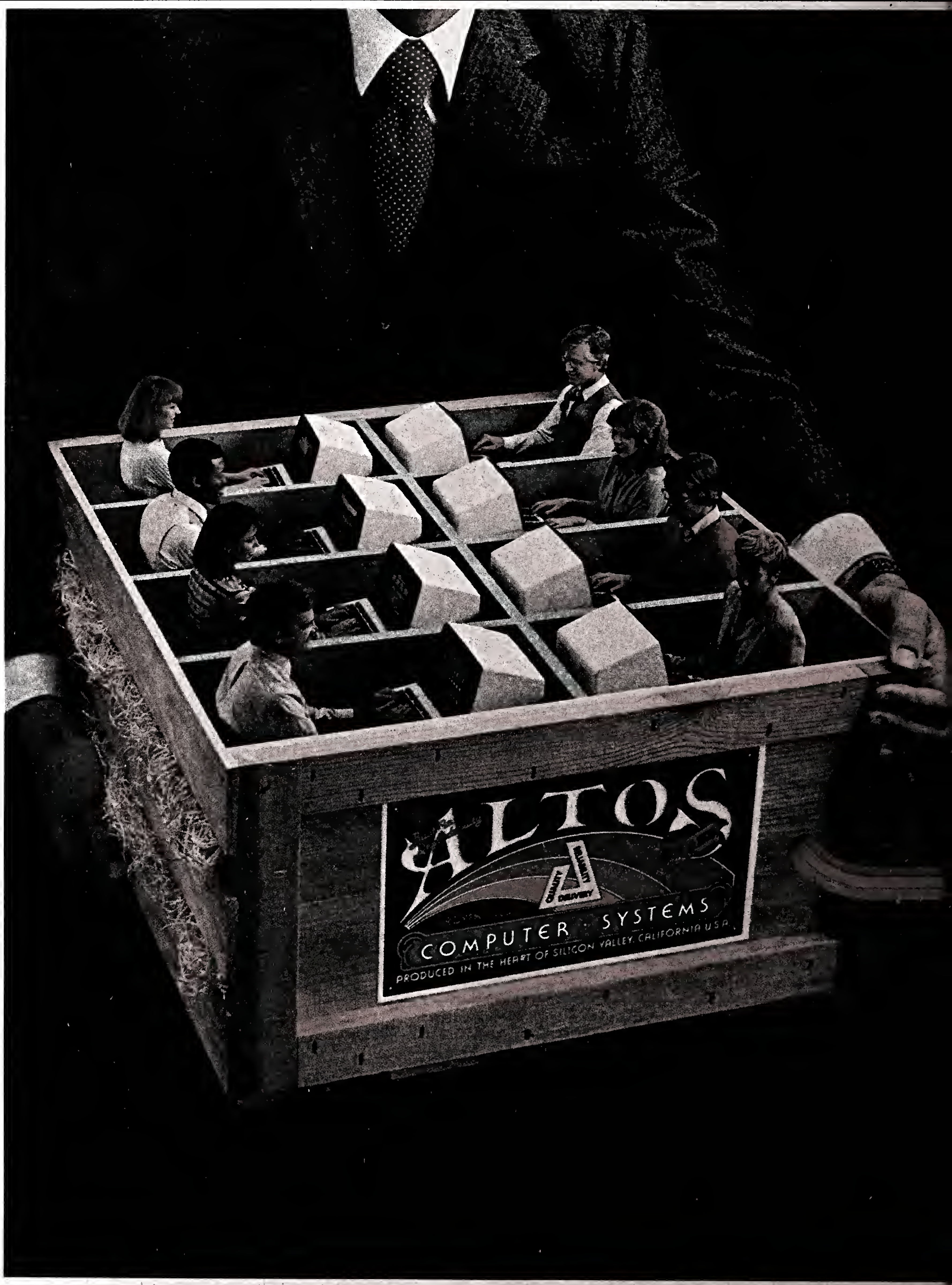

'Corcs' Transfers Spooled Files To WP for Wang, IBM

PARK RIDGE, Ill. — Computer Programming, Inc. has introduced software said to transfer Wang Laboratories, Inc. Office Information Systems and IBM 3270 Interface spooled files to word processing document files.

The Computerized On-Line Report Conversion System (Corcs) reportedly can handle either individual or multiple conversions by building a master conversion control file that contains the specified parameters.

Corcs is said to come with full system documentation, installation guide and user guide. A one-time license fee costs $975 for the first copy with discounts available from 35½ S. Prospect Ave., Park Ridge, Ill. 60068.

Cado Cuts Prices on Office Systems

TORRANCE, Calif. — Cado Systems Corp. has announced price cuts in its line of multiterminal office information systems. Prices of the Cado C.A.T. II, a four-port multitasking processor, have been reduced by $2,000 for diskette-based systems and $2,500 for Winchester disk-based systems.

The diskette systems now sell for between $11,990 and $12,990; the Winchester disk system now sells for $15,490. All systems include a printer, the vendor said.

The C.A.T. II consists of the processor with 48K bytes of memory integrated into a desktop keyboard/CRT terminal.

Cado Systems is located at 2771 Toledo St., Torrance, Calif. 90503.

Aid Teaches Wang WP Skills

MADISON, N.J. — Carnegie Press has published an audiovisual Wang Laboratories, Inc. Self-Teaching Program said to teach word processing skills in 15 hours.

Features of the package include: copying and moving information; deleting, replacing and inserting words; and using decimal tabs for automatic alignment and list merge.

Comprising nine cassette tapes, manual and carrying case, the package costs $195 from 100 Kings Road, Madison, N.J. 07940.

IWP Updates WP Glossary

WILLOW GROVE, Pa. — The International Information/Word Processing Association (IWP) is offering its "Information/Word Processing Glossary."

The publication, which is an updated version of IWP's 1978 "Word Processing Glossary," reportedly includes 1,500 terms from telecommunications, phototypesetting, data processing as well as word processing and commonly used management terminology.

The glossary costs $15 from IWP through Dorothy Logan, 1015 N. York Road, Willow Grove, Pa. 19090.

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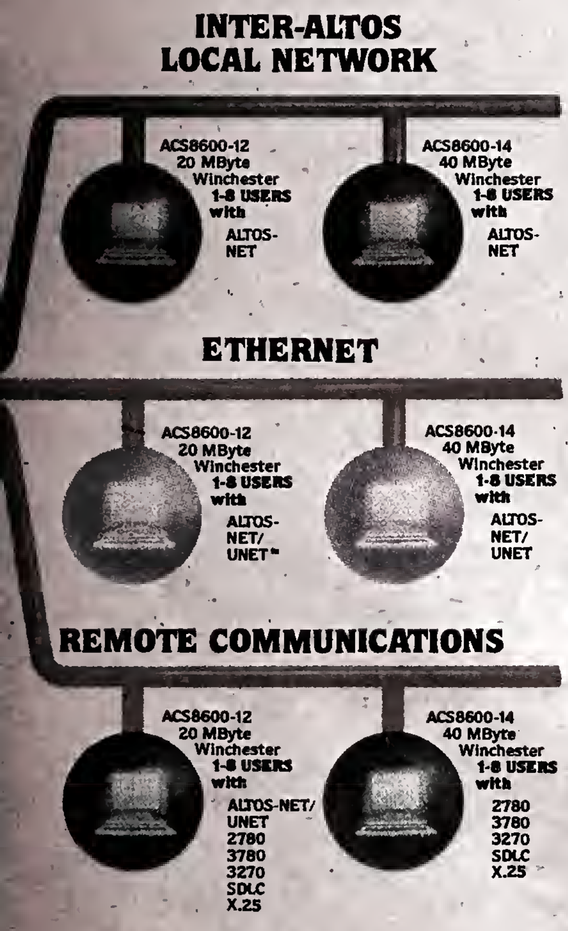
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U.S. Economy Seen Foiling UK DPers' Emigration Plans

By Robert Batt
CW West Coast Bureau

LOS ANGELES — Fully qualified systems analysts and programmers from the UK are being thwarted in their attempt to immigrate to the U.S. because of a downturn in the American economy, an executive recruiter here has claimed.

The conservative hiring policies of U.S. employers means a lot of much needed computer expertise is not being used, maintained Bernie Sidman, vice-president of the UK-based Overseas Recruitment Consultants. Sidman, whose company specializes in bringing programmers and analysts from the UK to work in the U.S., said a lot of inexperienced home-grown DPers are flooding the U.S. market, keeping out better qualified personnel from overseas.

However, the recently passed immigration reform bill, supported vigorously by the U.S. electronics industry [CW, Aug. 23], will allow 4,500 exemptions annually for foreign students completing U.S. computer science and and other high-technol-

(Continued on Page 74)

IBM Secrets Case May Alter Face of U.S./Japanese Links

By Marcia Blumenthal
CW Staff

The alleged theft of IBM trade secrets by two major Japanese electronics vendors apparently has not put a damper on technology development exchange agreements that U.S. computer vendors have inked with Japanese companies.

However, the case involving Hitachi Ltd. and Mitsubishi Electric Corp. [CW, June 28] has nonetheless touched a sensitive nerve and protectionist attitudes in regard to U.S-Japanese trade relations are surfacing, according to recent interviews with industry observers.

"When it comes to technology exchanges, the Japanese really do their homework and pick up information on the [U.S] company and its surrounding environment," observed Ron Napier, vice-president of Japan Economic Services at Data Resources, Inc.

As long as computers are not a stable market, the U.S. will maintain the edge, he said. "Computers have been a moving target and as long as they stay that way, the U.S. will maintain the lead. Japan cannot get a foothold in industries that are developing rapidly."

U.S. vendors are aware they have to protect their technological position and that awareness is rising, he continued.

While U.S. electronics vendors have been accused of being a soft touch when it comes to exchanging technology, Japan's disclosure of its technological developments is limited to information that is five or six years old, Napier maintained.

Participation in government-funded research and development consortiums in Japan is a major reason why U.S. vendors enter into joint technology development ventures with Japanese firms, maintained H. William Tanaka, counsel to the Electronic Industries Association of Japan. These ventures permit firms to learn about leading-edge technology and "keep track of the pulse of development," Tanaka remarked.

Basically, technology is knowledge and knowledge doesn't know natural borders and will leak out eventually, Tanaka observed. Besides, reverse engineering techniques are so well advanced it doesn't take long to incorporate new technology into products.

In the last analysis, it is up to the companies in each country to decide whether they want to become involved in joint research and development ventures, Tanaka concluded.

Sperry Univac is one company that has recently entered into such a technology pact. Univac is interested in learning more about Japan's work in color graphics, voice and semiconductors, reported Lou Casanova, the firm's vice-president for joint ventures in Japan.

While the technology to be exchanged in this pact is still nebulous, Casanova said the firm will not be sharing any technology related to its high-end processors with the Japanese. The procedure for research exchange is tightly monitored, Casanova said, with a six-person steering committee overseeing these activities.

(Continued on Page 82)

Ibis Countersues Burroughs, Seeks Damages to $85 Million

LOS ANGELES — Ibis Systems, Inc. has filed a countersuit against Burroughs Corp. and its subsidiary, Memorex Corp., that seeks up to $85 million in damages for allegedly conspiring to thwart Ibis' development of high-end, IBM-compatible disk systems and financing plans.

The counterclaim is a response to a $22 million trade secrets suit Burroughs filed last month against Ibis [CW, Aug. 9].

The countersuit claims that Burroughs and Memorex have conspired to destroy Ibis in an attempt to maintain Memorex's position in the IBM-compatible disk arena, that Burroughs has attempted to obtain confidential and proprietary information about Ibis and that these "predatory and unfair" acts could violate the antitrust laws by eliminating Ibis as a competitor.

Ibis is seeking $25 million in compensatory damages, which could be tripled, and $10 million in exemplary damages.

Meanwhile, Burroughs has responded to a court order to produce the specific trade secrets that were allegedly stolen by Ibis. However, that information is confidential. Attorneys for Ibis are currently reviewing Burroughs' response and declined to comment on the allegations by the Detroit mainframer. The law firm reported it has started depositions of Burroughs personnel.

Vendors Seen Jumping Into Mini Software Arena

FRAMINGHAM, Mass. — While the software arena for small business and desktop systems is still largely a cottage industry, mainframers, mini makers and established systems houses and independent vendors will increasingly make a play for this lucrative market, according to a recently published report from International Data Corp. (IDC).

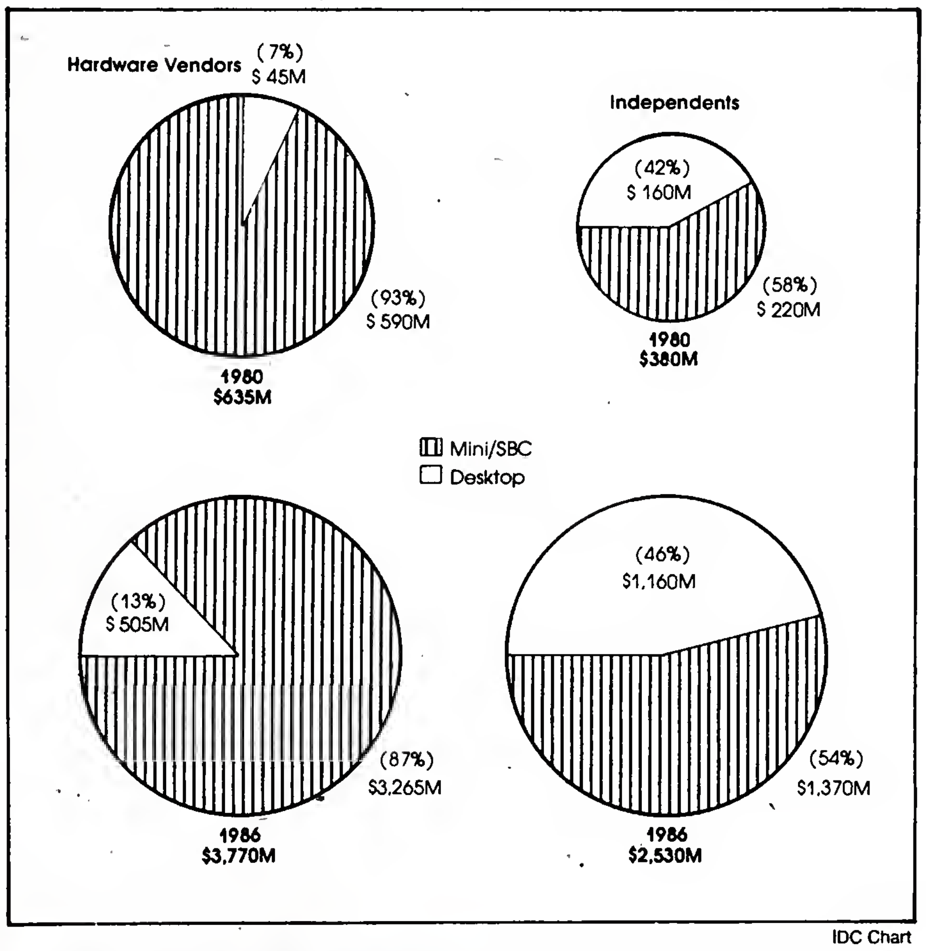
This is not surprising as last year more than 50% of the computers installed in the U.S. were classed as minicomputers or smaller systems. And by 1985, these units will comprise more than 70% of that base, IDC pointed out. Shipments of desktop systems are growing at nearly 50% per year, the research firm said.

At the current time it is not an easy task to find market leaders in the small end of the software market. The mini market has been very applications-oriented, geared to the needs of specific industries. As a result, much of the software for this market has been sold through systems houses and OEMs, the report said. In 1980, stand-alone packaged software from independents and systems houses comprised 56% of the market for minicomputer software.

Although revenues that hardware vendors derive from minicomputer and small business systems software were $590 million in 1980 compared to revenues of $220 million for independent suppliers, the independents software revenue growth will be 39% annually vs. 32% annually for hardware vendors during the next several years, the report projected (see chart at right).

In contrast, software sales for desktop computers is skewed in favor of the independents. In 1980 hardware vendors garnered revenues of $45 million from sales of this type of software, while independents' sales totaled $160 million, IDC esti-

(Continued on Page 74)



IDC Chart

Comparison of Software Revenues, Hardware Vendors And Independents (1980 and 1986)

Univac MCO Completes Consolidation

BLUE BELL, Pa. — Sperry Univac has completed the consolidation of its Mini-Computer Operations (MCO), presently based in Irvine, Calif., by folding the product development and marketing support activities of that unit into various other corporate organizations.

The staff of the MCO organization currently numbers about 186 people, but the consolidation is expected to result in an as yet unspecified personnel reduction. This will be accomplished starting this month and completed during the next eight months, the firm said.

The engineering and support portion of MCO will be moved to Salt Lake City, Utah, while field support will be merged into various Sperry Univac offices.

The final phase-out follows several similar moves, which started last November with the transfer of the firm's distributed data processing sales specialists to various branch offices.

In addition, last December the manufacturing operations of MCO were transferred to Sperry Univac's Communications and Terminals Division in Salt Lake City.

New Companies

Power Solutions is a company specializing in ac power analysis and the specification of all types of power conditioning equipment. Power Solutions is located at 118 N.E. 2nd St., Boca Raton, Fla. 33432.

Pulsar Systems, Inc. is an organization specializing in software and turnkey systems for the full line of Prime Computer, Inc. computers. The firm is located at 1259 Rt. 46, Building 2, Parsippany, N.J. 07054.

Cdex Corp. is a organization formed to further develop computer-assisted training products. The company is located at Suite 200, 5050 El Camino Real, Los Altos, Calif. 94022.

Gull Resource Management Systems is a firm specializing in net change materials-requirements-planning manufacturing applications as a Prime Computer, Inc. dealer. Their firm, a subsidiary of Gull Airborne Instruments, Inc. can be reached through P.O. Box 9400, 100 Parkway Drive S., Smithtown, N.Y. 11787.

Prime Starts Two Sections

NATICK, Mass. — Prime Computer, Inc. has created two new operations within its manufacturing department:

- The manufacturing engineering organization's primary responsibility is for bringing the company's products into the production cycle. Donald E. Quigley, director of volume engineering, was named director.
- The manufacturing systems organization will establish standards for business and management informations systems within manufacturing.

. Michael Hurley has been named director.

The firm said it made the recent restructuring to emphasize the coordination and planning required to handle large multisystem orders.

In other appointments, Prime named P. Javed Chaudhary as vice-president of production operations, Edward J. Bradley as manufacturing controller and Richard B. Goldman as director of material management in manufacturing.

All of the new appointees report to Robert P. Berkowitz, senior vice-president of manufacturing.

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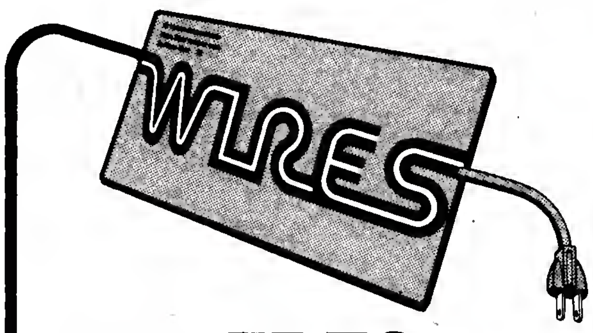

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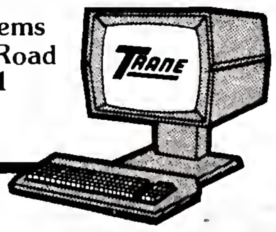

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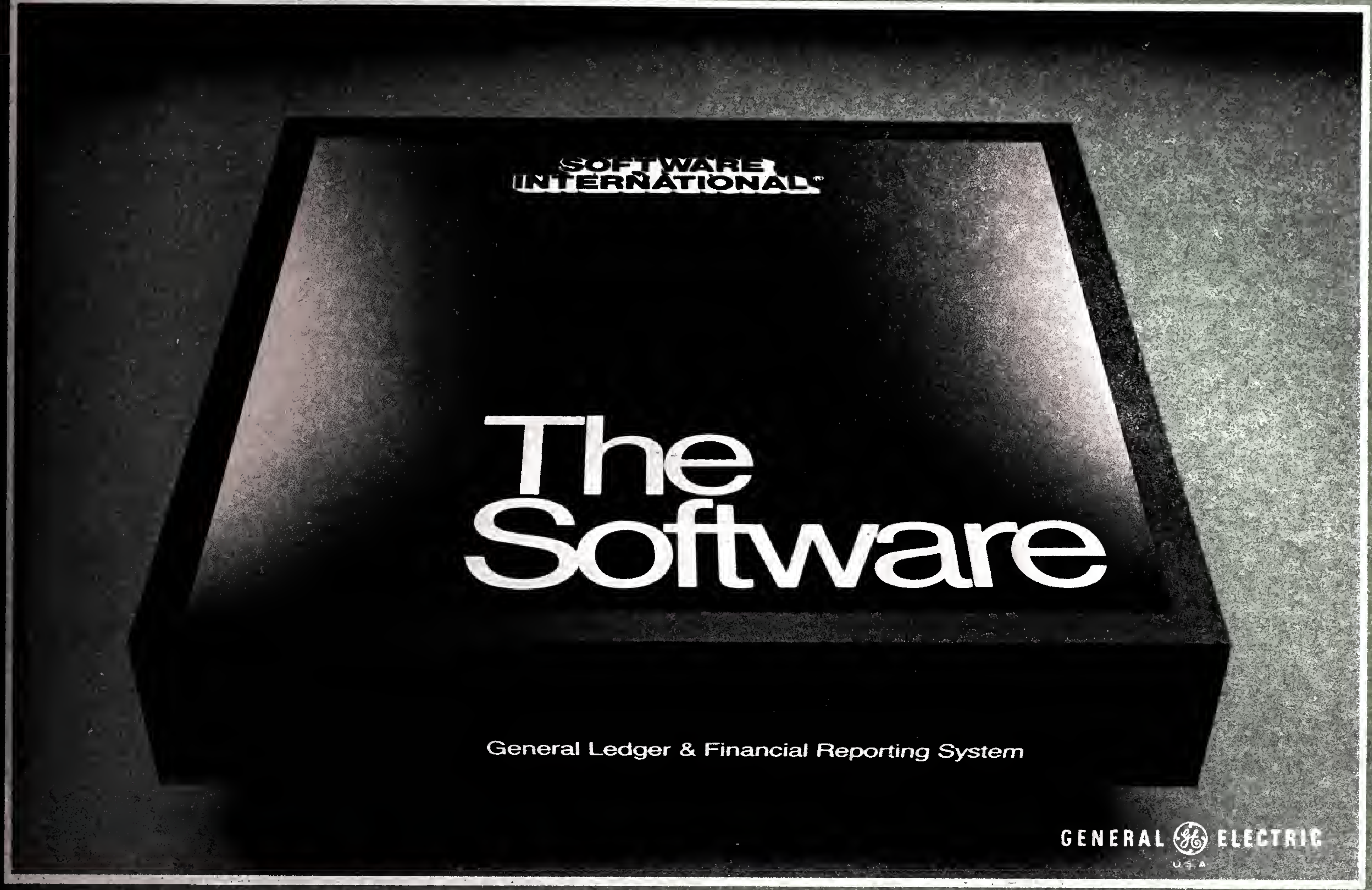

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Burroughs Plant to Close

PISCATAWAY, N.J. — Burroughs Corp. plans to close its engineering and manufacturing plant here during the first quarter of 1983. The plant manufactures storage products for the firm's computer systems.

In making the announcement, the firm said that advances in computer storage technology and a corporate-wide program of production facility consolidations were the reasons for the closing. Some of the plant's 440 employees will be offered jobs at other Burroughs facilities; the remainder will receive placement assistance.

Burroughs facilities in California and Pennsylvania will absorb the engineering and manufacturing responsibilities of the Piscataway plant. The plant had been a secondary source for production of the B1900 system.

U.S. Firms Not Hiring UK DPers

(Continued from Page 69)

ogy programs to work in this country.

Conservative Practices

"The U.S. employers are very conservative when it comes to hiring practices, Sidman asserted. Often times the local DP people are not of the quality required by companies yet. Unless they are embarking on a substantial recruitment drive, employers here are reluctant to spend the time and money to go overseas to interview people.

Sidman claimed that UK programmers and analysts are acknowledged as among the best in the world. It is frustrating, he said, that many of those who want to work in the U.S. are unable to do so.

"The state of the U.S. economy has a lot to do with this," he said. "Right now market conditions are very flat, but if the economy turns around I am sure we will see an explosion of UK DP people into the U.S."

Typical Example Cited

Sidman cited one UK DPer as a typical example of a highly skilled technician unable to find work in the U.S. His client, he said, had over eight years' experience as a project leader, systems analyst and consultant. He currently works in the UK for a leading U.S. software house and has experience with a wide variety of IBM equipment including the 360, 370, 4341 and 3033 systems. This particular DPer is also apparently knowledgeable in the DOS/VM, DOS/VS and MVS operating systems, among others; he knows Cobol, Fortran, assembler, RPG and DL/1 languages and has worked with the CICS and TSO.

"With that kind of background you would think he would be exactly the sort of person U.S. employers would snap at the chance to hire," said Sidman. "He's the sort of guy who should be offered a job by anyone, but so far we have had him on our books for over two months without being able to place him."

Sidman claims his company currently has between 30 and 40 highly qualified DPers in the UK waiting for the chance to come and work in the U.S., many of them with extensive experience in the IBM field. There was, he concluded, a high degree of interest being shown by highly skilled programmers and analysts to come and work on the other side of the Atlantic.

Growth Seen In Mini Mart

(Continued from Page 69)

mated. By 1986 independents will have revenues of $1.1 billion from this segment, while hardware vendors will claim $505 million of the market.

In the desktop arena, business software is estimated to comprise 53% of the market; scientific applications account for 35% of the market, while education and home markets follow with 5% and 7%, respectively.

The report, titled "Small System Packaged Software: An Overview," is an extension of IDC's prior study, "Packaged Software Statistical Reference Book." It is available as part of IDC's Continuous Information Services or can be purchased from the research firm at 5 Speen St., Framingham, Mass. 01701.

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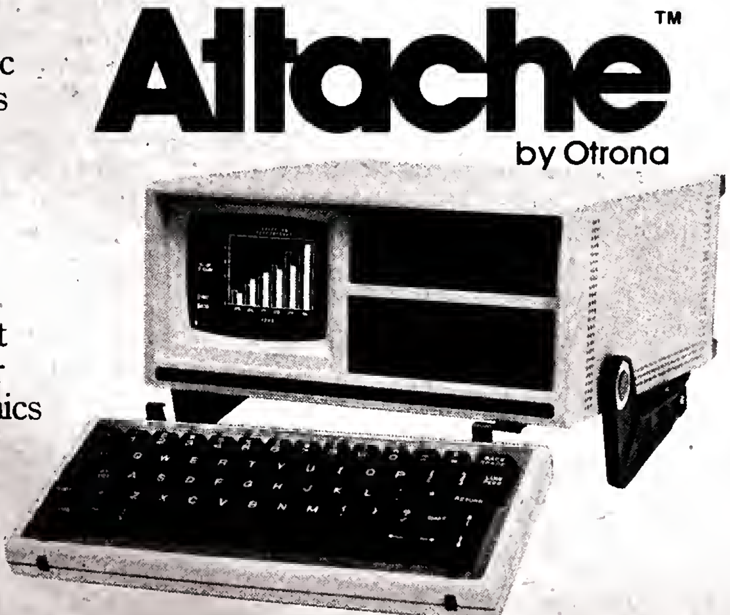

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Problems With Intellectual Property

When Is Software Patentable? Some Signs Exist

By Norman L. Wilson Jr.
Special to CW‡

The U.S. Patent & Trademark Office recently granted a patent for working with information contained in data records.

Information in related records was merged and rewritten by:

- Reading the data records.
- Reading related records.
- Writing the merged information.
- Again reading related data records.
- Writing the latest merged information.
- Repeating the last two steps.

Is this a computer program? Reading, writing and repeating steps could certainly pass for coding. In any case, the issuance of the patent illustrates the difficulty of answering the question, "Is this software patentable?"

The cost of generating software is rising and it has never been low. Developing programs involves time, ingenuity and money. Hence, the patentability question must be raised, no matter how difficult the answer. In fact, each time a program is ready for the market, the question should be asked, "Is this software patentable?" This question cannot always be answered with certainty, but there are signs along the path to patentability.

Initial Premise

Starting with the patent statute will lead to the Patent Office's initial premise. The Patent Act defines for us the types of inventions that are patentable: machines, such as printers; articles, such as computers and ribbons; compositions, such as plastics used for circuit boards; and processes, some software. Inventions that do not fit into one of these statutory slots are said to be nonstatutory, and accordingly, unpatentable.

Congress did not provide a slot for abstract ideas such as mental steps, mathematical formulas and laws of nature. To prevent these from being widely used was considered against public policy. Ideas, it was thought, should be available to everyone.

Software has always been on shaky ground in the Patent Office. Computer programs, according to the Patent Office, are in the abstract-idea category. Algorithms are viewed as mental steps or mathematical formulas. As such, they are not considered patentable.

Abstract-Idea Concept

The software base became even more unsettled when the Patent Office extended the abstract-idea concept. It took the position that if a part of something is erroneous, then the whole has to be defective. Hence, if a portion of an invention is nonstatutory, the entire invention is nonstatutory and, therefore, unpatentable. This, of course, opened the door for the courts. The Court of Customs and Patent Appeals (CCPA) stepped through this opening and has been in conflict with the Patent Office ever since.

Initially, the CCPA refrained from considering the Patent Office view that algorithms standing alone were unpatentable as nonstatutory under the abstract-idea doctrine. The court did, however, challenge the principle that if one part of the invention is unstatutory, then so is the entire invention. In cases where a program or algorithm is part of an invention, the CCPA in effect declared, "Let's look not only at the algorithm, but at the blend of the algorithm with the other steps or elements of the invention. Allowance of such patents," it offered, "does not prohibit all uses of the algorithm — only the use of the algorithm in the environment of the invention. Other uses of the algorithm are available to the public."

Thus began the inevitable conflict between the CCPA and the Patent Office, the Patent Office adhering to its nonstatutory position and the CCPA scrutinizing each particular combination. Ultimately, the Patent Office backed away from its view that the unstatutory part made the whole unpatentable. It announced that if the algorithm was the essence, crux or point of novelty of the invention, then the invention was unpatentable as unstatutory.

Nevertheless, appeals from the Patent Office to the CCPA were routine. The Patent Office rejected computer program applications, but the CCPA reviewed and allowed many of them. It remained, then, for the issues to be considered by the U.S. Supreme Court.

The Supreme Court agreed to umpire the Patent Office/CCPA conflict, and, as a consequence, handed down two decisions now on the lips of all intellectual property lawyers: Gottschalk vs. Benson and Parker vs. Flook.

Unfortunately, although computer program patentability was considered by the Supreme Court, the matter was not totally resolved. While answering the questions before it, the Supreme Court did not depart from the narrow issues involved in those cases to give, as it sometimes does, some sense of direction. In shying away from the broader issues, the court declared, "We would require a clear and certain signal from Congress before approving the position of a litigant who, as respondent here, argues that the beachhead of privilege is wider."

Algorithm Patentability

It was hoped that the Benson case would settle the question whether algorithms alone were within the patent statutes or were in the abstract-idea, nonstatutory category. The court did not decide that issue. Rather, it turned its attention to the specific question before it, that of a mathematical formula having no limitations on its end use. It was this breadth that concerned the court, the fact that the mathematical formula would be totally "preempted," that is, completely withheld from the public. The Benson court accordingly proclaimed that an algorithm that is not limited to a particular use is not patentable.

The influential factor in the Benson case was indeed the fact that the algorithm covered both known and unknown uses.

In the Flook case, the Benson test seems to have been met. The inventor argued that he "does not seek to wholly preempt the formula, only its use in the oil refining industry." But the Supreme Court applied a different line of reasoning. It found the refining process to be generally known and concluded that an old process when combined with a new algorithm does not become a new process. A new algorithm does not make an otherwise conventional method patentable.

A frequent caveat has been — "Don't look to patent law for help in software protection. No one knows where it stands!" This is probably attributable to the Supreme Court's announcement in the Flook case that "we must proceed cautiously when we are asked to extend patent rights into areas wholly unforeseen by Congress."

However, patent law must not be dismissed when considering the protection of software. Even the court in the Flook case admitted, "the line between a patentable process and an unpatentable principle is not always clear." Moreover, in the Benson case, the court, in discussing prior cases, stressed "It is said that the decision precludes a patent for any program servicing a computer. We do not so hold." There is, then, some encouragement in the decisions. Accordingly, it is important to distill from them the principles they contain.

Principles

1. The Supreme Court is reluctant to rule either way on the patentability of an algorithm standing alone, believing it is up to Congress. The Benson court frowned on the attempt

(Continued on Page 81)

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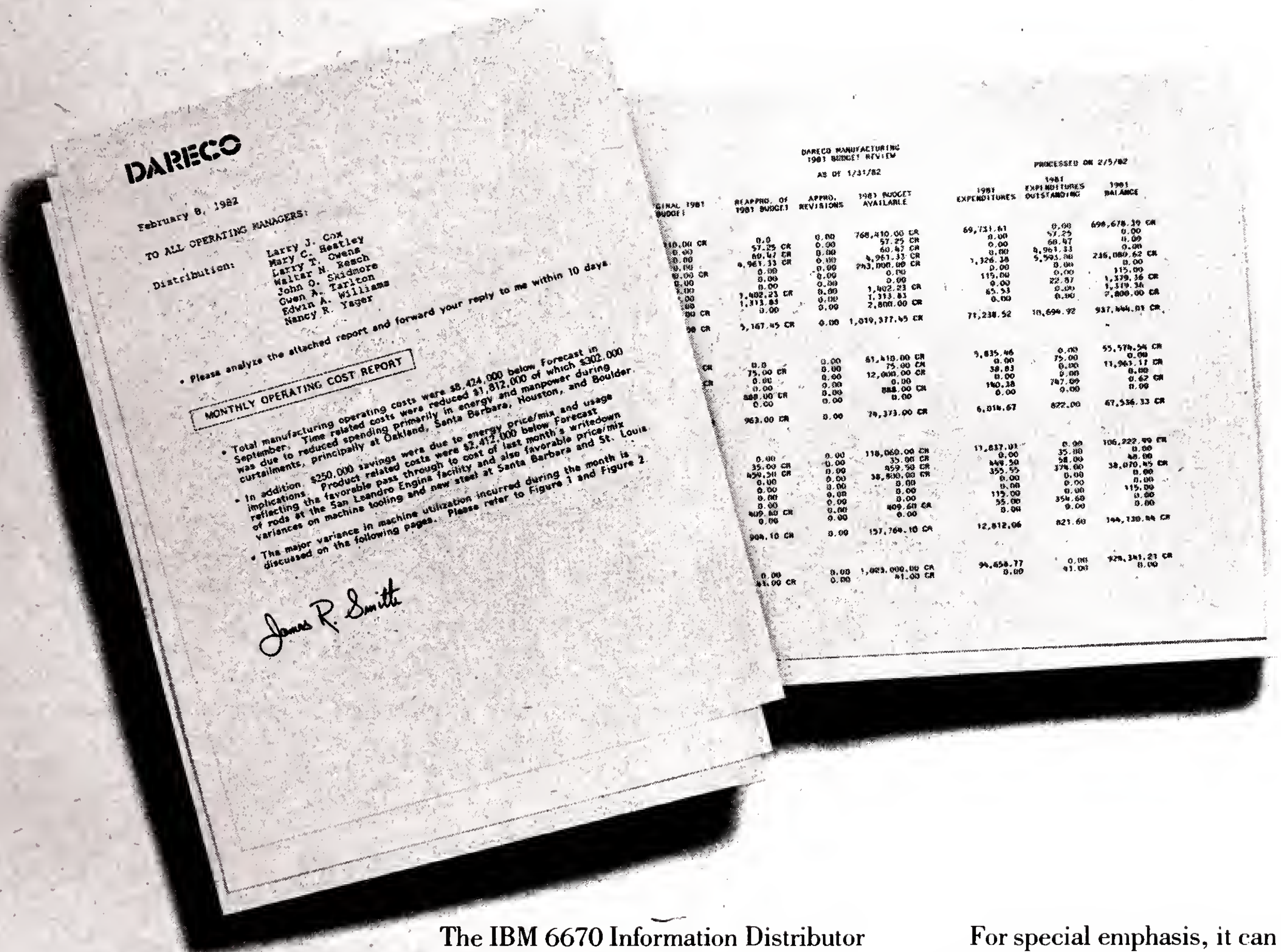

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- In addition, $250,000 savings were due to energy price/mix and usage implications. Product related costs were $2,412,000 below Forecast reflecting the favorable pass through to cost of last month's writedown of rods at the San Leandro Engine facility and also favorable price/mix variances on machine tooling and new steel at Santa Barbara and St. Louis.
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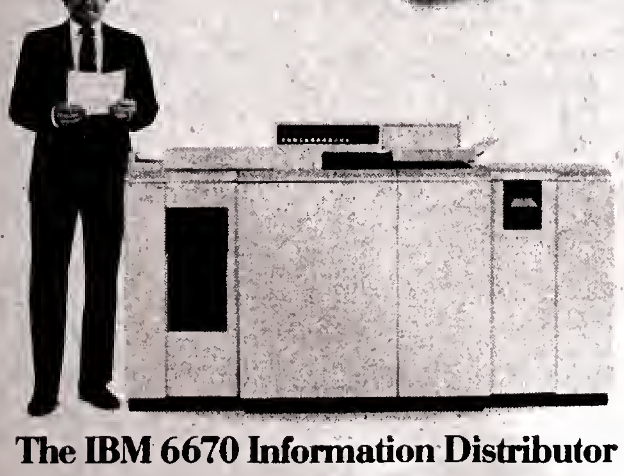
James R. Smith



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Patent Process Raises Questions

(Continued from Page 76)

to prohibit the use of the algorithm in processes not yet discovered. The process sought to be patented should not seek to preempt the algorithm wholly, only its specific use.

2. The invention in Flook was unpatentable not because it included an algorithm, but because considered in its entirety, the discovery was not unique or inventive. It left intact the early CCPA view that combinations of algorithms with other steps are patentable. In fact, the CCPA in June of this year pronounced "a process is not unpatentable simply because it contains a mathematical algorithm." Courts will look at the combination of the algorithm with the remaining operations and then ask "Is this a new process?"

3. In the Flook case, an algorithm was inserted into an old process. If the new algorithm is merely a step in the old process, the result is not patentable. Had the algorithm been combined, even with old elements, to form a new process, the result would have been patentable. Games and many computer processes are new combinations and, hence, patentable as such.

4. Implicit in the Flook case is another area of patentability, illustrated by the process described in the first paragraph of this article. This is to differentiate between algorithms that drive a computer and those that merely are more easily executed by a computer. Whereas a process consisting of instructions for a computer standing alone is unpatentable, a computer-implemented process, one that can be run without a computer, can be patented.

Ultimate Effects

Processes such as the one illustrated in the introduction, when viewed by a casual observer, appear to be computer programs. These processes, which are more readily accomplished by a computer, in contrast to those instructing the computer, are frequently overlooked. They are patentable albeit they contain mathematical expressions or mental steps such as READ, COMPARE, CALCULATE and so on.

The foregoing discussion has attempted to illustrate that the door to software protection is not completely closed. Each program should be considered separately on its merits. Patentable processes, unpatentable principles and algorithms, whether or not patentable, are concepts to be examined in view of their ultimate effects. The environment or process as a whole should be considered in deciding patentability of software.

Wilson is an attorney based in St. Louis, specializing in patent law.

Correction

The statement in "National Semiconductor Lays Off 1,000 Employees" [CW, Aug. 16] that several individuals had been laid off at National Advanced Systems, a National Semi subsidiary, was incorrect and was based upon erroneous information supplied by National Semi's corporate headquarters.

Supershorts

Boston real estate developers Leggat McCall & Werner have dropped plans to build a computer exhibition center in suburban Dallas. The company's program rivaled a plan by Texas-based developer Trammell Crow. That firm will continue with its plan for the Infomart.

— — —

McGraw-Hill Book Co. has formed a new editorial group as part of its College Division to develop texts and software for computing courses and software for other educational areas.

— — —

Storage Technology Corp. said its board of directors approved the repurchase of up to $25 million of its outstanding $100 million, 9% convertible subordinated debentures due in 2001.

— — —

Digital Equipment Corp. has granted funds to Carnegie-Mellon University and the University of Massachusetts at Amherst for artificial intelligence studies.

— — —

Mitsubishi Electric Corp. has consolidated each of its sales sections under the Office Computer, Personal Computer, Facsimile, Word Processor and Point-of-Sale System Divisions and has established the Office Automation Division.

— — —

BASF Systems Corp., Micro Peripherals, Inc. and Brown Disc Manufacturing, Inc. have joined a group of disk drive and media manufacturers working to develop a size and packaging standard for the next generation of sub-4-in. computer disks.

— — —

Signetics Corp. has announced plans to lay off about 400 of its 6,000 U.S. employees.

— — —

Monolithic Memories, Inc. has formed a Military Products Division.

— — —

Ungermann-Bass has formed a Systems Integration Group to offer customers site planning, system design, requirements and analysis and hardware and software support for both baseband and broadband Net/One communications systems.

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Memorex Cuts Disk Workers

SANTA CLARA, Calif. — Memorex Corp. has announced a reduction in its work force by about 100 people employed in its disk drive production facilities located here.

Company officials cited a slowdown in demand for certain disk products as a reason for the layoffs.

The firm has offered most of those workers transfers to other product groups, particularly communications offerings, a company spokesman said.

The reduction involved only production workers and manufacturing support personnel.

Directory of Suppliers Out

Studies Examine CAD/CAM Mart

The fast-growing computer-aided design and manufacturing (CAD/CAM) market is examined in three separate studies available now.

International Data Corp.'s (IDC) *Value Added Suppliers in Graphics Markets* forecasts growth through 1986, details the growth of major large-system vendors through 1982, examines their targeted applications and analyzes opportunities for small-system vendors. The 74-page study costs $2,500 from 5 Speen St., Framingham, Mass. 01701.

The 127-page *The U.S. CAD/CAM Systems and Business Graphics Markets* report from Marketing Development, Inc. discusses the technology behind these systems and looks at the individual submarkets within the categories. Each of the submarket sections gives size of market projections and the market shares of the leading suppliers. The study also features profiles of some leading CAD/CAM manufacturers. The study costs $795 from the firm at 402 Border Road, Concord, Mass. 01742.

Williamson & York, Inc.'s *The Low Cost CAD System: Requirements and Market Opportunities* investigates the areas of user needs, cost/performance expectations and methods of justification. All aspects of the purchasing decision are analyzed, along with identification of the decision makers. The 31-page report, priced at $12,000, includes a five-year market forecast. The firm is located at Suite 108, 5622 Dyer St., Dallas, Texas 75205.

Another CAD/CAM Report

Technology and Business Communications, Inc. has released its 1982-1983 edition of the "S. Klein Directory of Computer Graphics Suppliers." The directory predicts that some hard times loom ahead for some suppliers of graphics and CAD/CAM systems.

The directory lists some 300 computer graphics and CAD/CAM companies in the U.S. and Canada, listing data such as contact people, company size, sales volume, products and services. A cross-index provides reference to vendors according to applications of interest and technology.

The 128-page directory is available for $47 from the publishing company located at Suite 27, 730 Boston Post Road, Sudbury, Mass.

U.S./Japan R&D Raises Questions

(Continued from Page 69)

U.S. vendors should be savvy enough to admit there is good technology available outside the U.S. Whatever the outcome of the agreement, Casanova said, Sperry Univac thinks the experience is worthwhile. "We may come to the conclusion two years from now that there is no point in pursuing this. We want technology exchange, but we don't want the Japanese to eat our lunch," he said.

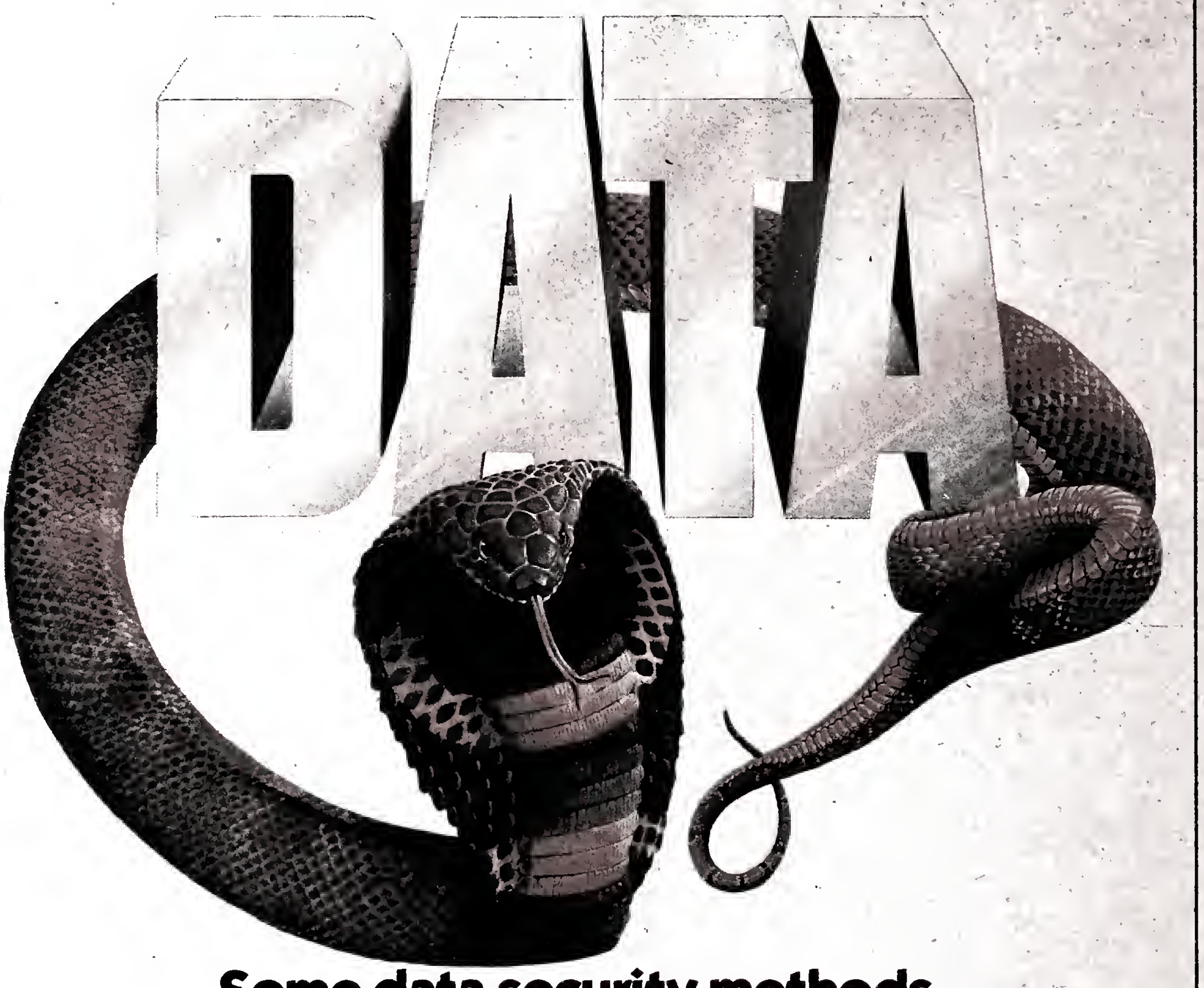
One vendor, who asked not to be identified, said some of its OEM customers are aware of and are not overly pleased that it is exchanging ideas with a Japanese company that competes on a systems basis with those OEM customers. Nonetheless, the world of semiconductors, for example, is already a "tangled web of relationships" so it becomes a problem when something like the trade secrets issue surfaces.

Last April, IPL Systems, Inc. entered into an agreement with Mitsubishi for the development of an IBM-compatible processor using Mitsubishi's computer-aided design and large-scale integration technology [CW, April 26].

The agreement is written in tight enough language so that it limits Mitsubishi's access to IPL technology, Lee Gendron, vice-president of OEM and technical operations, said. The Japanese are obviously interested in IBM technology. "They don't have the day-to-day experience working in an IBM world," he said.

Intel Corp. has exchange areements wtih Fujitsu Ltd. for its 8086, 8088 and 8089 microprocessors and with Nippon Electric Co. for certain peripheral equipment.

Intel relies on its contracts to structure the scope of the agreements. "Our agreements are more precisely focused on needing second-source manufacturers," James Jarrett, a manager of corporate communications at Intel, explained.



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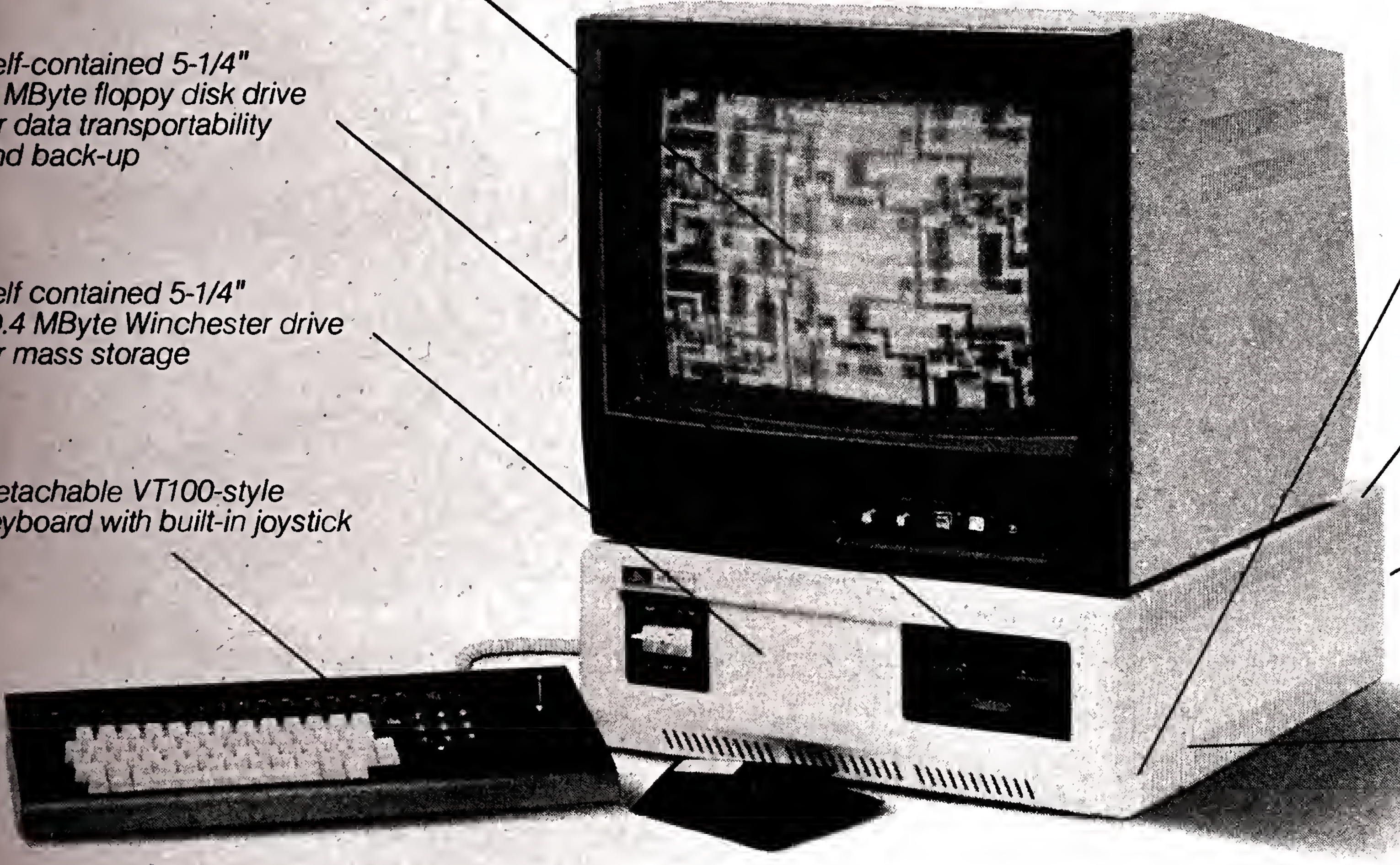

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Orders & Installations

Collier-Jackson has been awarded a contract by *The Des Moines Register-Tribune* for the installation of Collier-Jackson's Circis/3000 systems, a software package for newspaper circulation systems. The newspaper plans to convert the Circis/3000 systems to its Sperry Univac 1160 hardware in four phases — distribution, customer service, carrier billing and paid in advance.

Scientific Research Management Corp. (SRMC) received a $30,000 contract for third-party computer maintenance from the U.S. Geological Survey (USGS). SRMC will work on USGS Digital Equipment Corp. PDP-11/70 and PDP-11/23 at its Menlo Park, Calif. facilities. Both PDP-11s are mixed-vendor systems with many third-party peripherals, including Control Data Corp.'s 9766 disk drives and Storage Technology Corp.'s 1953 tape drives.

Systems Integrators, Inc. (SII) has announced the signing of a contract for the sale of a System/55 to the *Miami Herald*. At the same time, SII and the *Miami Herald* entered into an agreement for the development of a newshole composition system.

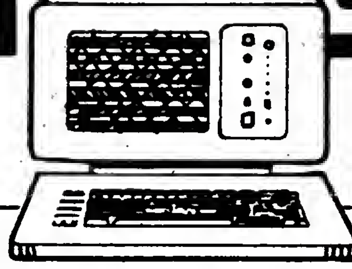
Atari has received an order from the Department of Defense' Dependents Schools for approximately 1,370 Atari home computers and peripherals. The order is valued at more than $3 million. The first deliveries will be made next month and the remainder will be delivered over the five-year life of the contract. All of the systems will be used in the education of minor dependents of U.S. Department of Defense military and civilian personnel stationed overseas.

Prime Computer, Inc. has sold a Prime 850 system and peripherals to Intermedics, Inc. of Freeport, Texas, a manufacturer of medical products.

Maryland Computer Services, Inc. has announced the installation of Total Talk, a computer terminal with speech capabilities, at the Maryland Rehabilitation Center in Baltimore. It will be used by blind and visually impaired data processing students.

Executive Corner

- John M. DeAno has been named president of the Computer Technology Group, a new division of Telemedia, Inc.
- Randy Weaver has been appointed president and chief operating officer of Anadex, Inc.
- Richard V. Palermo has been appointed president and chief executive officer of Local Digital Distribution Co., a partnership of Aetna Life & Casualty and M/A-COM Inc.
- James K. Berrett has been named president, chief executive officer and a member of the board of directors of Computervision Corp.
- Martin H. Belsky has been designated vice-president of application software development at Burroughs Corp.
- Stanley Guzik, vice-president of international operations for Halcyon Communications, Inc., has been appointed vice-president of marketing.
- Paul D. Fay has been selected as executive vice-president of Corodale, Inc.
- David Litwack has been named vice-president of product development for Cullinane Database Systems, Inc.
- James J. Hawkins has been designated vice-president of sales and marketing for ECS Telecommunications, Inc.
- Louis C. Cole has been promoted to vice-president of logistics at National Advanced Systems, Inc.
- John C. McDonald has been elected vice-president and chief scientist of Continental Telecom, Inc.
- Girroy E. Mansur has joined the Diebold Group, Inc. as vice-president of the marketing division.
- David E. Resnik has been appointed vice-president of sales for Eagle Software Publishing, Inc.
- Ralph Reda has been designated vice-president of sales for The Bohle Co.
- Robert Biddinger has been selected vice-president of human resources for Seagate Technology.
- Michael F. Kraley has been promoted to vice-president of the computer systems division and Robert F. Gorman has been promoted to vice-president of underwater technologies at Bolt Beranek and Newman, Inc.
- James Manion has been promoted to vice-president of Eastern operations for ASK Computer Systems, Inc.
- Atam P. Lalchandani has been promoted to vice-president and treasurer at National Advanced Systems, Inc., a subsidiary of National Semiconductor Corp.
- Dan Denise has been named vice-president of sales for Pyramid Technology.
- David J. Maxwell has been appointed group vice-president for program management and product assurance; Donald J. Bowen succeeds Maxwell as a vice-president of the systems division; and David C. Karlgaard has been appointed a vice-president of the systems division of Computer Sciences Corp.
- Michael Gilbert has been designated vice-president of development at Integrated Office Systems.



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- Designing and using national multi-user and multi-function networks
- Network management technologies and how they have evolved
- Teleprocessing system performance
- Telecommunications and DP managers

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CICS
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If you qualify, please call:
Suzanne Radovic
(305) 592-2610

or send your resume to her attention

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8125 N.W. 53rd Street
Miami, Florida 33166
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Pearl Equipment seeks sales management motivated person for Computer Sales & Leasing Division. We deal in **IBM** Systems 34 & 38 and 3741/3742. Require detailed knowledge and experience marketing IBM Computers. Relocate in Nashville, TN.

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Reply to CW-A3311
Computerworld
Box 880
Framingham, MA 01701

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

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Requires creative, highly motivated professionals with extensive background in systems programming or control systems software development. Results-oriented, customer responsive environment. Development openings are within the following groups:

- **Database**
- **Data Communications**
- **Integrated Data Dictionary**
- **On-Line Query**
- **Audit-Retrieval**
- **Application Development System**

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Requires senior level (minimum 3-5 years) experience in design, development and implementation of financial (general ledger, A/P, A/R, etc.) or manufacturing applications. Database background essential. Project leadership experience desirable. Good communication skills and ability to work independently.

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Professionals with a high degree of expertise are needed to provide technical support via the telephone to **Cullinane's** growing community of users. Success in this role requires the demonstrated ability to interact and communicate effectively with users. Requires extensive Assembler with experience in one or more of the following: 3-5 years in systems programming; database systems such as IDMS or IMS; on-line systems such as IDMS/DC or CICS; installing and maintaining BTAM, VTAM or TCAM. Occasional travel required.

Opportunities are available at our Regional Offices in Atlanta, Chicago, Los Angeles and Philadelphia as well as in our Headquarters in Westwood, MA.

For prompt, confidential consideration, please forward resume, specifying position of interest, to Carolynn Levy, Dept. 830CW, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090.

Database Software Sales Representatives

Excellent opportunities for sales professionals who can demonstrate a successful track record in vendor software sales or have a strong background in data processing/database management with IBM or compatible equipment.

Product Marketing Managers

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- **Financial Systems**
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Exceptional opportunities are available for individuals who possess a high degree of technical expertise and the ability to communicate systems concepts to prospective users and our own field sales organization. Qualified candidates should possess excellent presentation skills and be able to develop multi-media presentations and various sales support tools. A full degree and some marketing exposure helpful.

For prompt, confidential consideration, please forward resume, specifying position of interest, to Roy Evarts, Employment Manager, Dept. 830CW, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090.

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C Database Systems
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SYSTEMS PROGRAMMER

A leader in the security industry, Wackenhut Corporation, seeks a Systems Programmer for its Miami Corporate Headquarters.

Background in IBM System DOS/VSE I or II, is essential. CICS/VS, Power RJE and VSAM background is highly desirable, as is experience in converting DOS to OS.

Our attractive salary/benefits package is complemented by a 4-day 40-hour work week. For prompt consideration, please send your confidential resume to:

WACKENHUT CORPORATION
Human Resources
3399 Ponce De Leon Blvd.
Coral Gables, FL 33134

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World-wide Fortune 500 mfg co has two (2) positions avail. for DP pros, one for a Sr. Systems Analyst & the other for a Project leader. Both positions require System 34 exp. along with a min. 2+ yrs. system design bkgd. in a mfg. environment. Applications must include order entry. Mapics a plus! Project Leader must have supervisory capabilities to oversee four (4) technical pros. This well managed installation is comprised of a Sys 34. Sys 38 as well as talented profesnl. staff. Hi visibility & exceptional promotional optys.

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PERSONNEL CONSULTANTS
Phone (813) 933-5838
P O BOX 271431, TAMPA, FL 33688

DATA PROCESSING MANAGER

A major Southern Florida facility is seeking a highly motivated individual to head up its Data Processing Center.

The qualified candidate will be responsible for 50 to 75 staff members in a multi-user environment. Demonstrated success in the management of large-scale computer operations centers/data centers (Burroughs would be ideal) and the design, development and implementation of these systems is highly desirable.

This position affords an exceptional salary and benefit package. Qualified applicants, please send your resume and salary history in confidence to:

CW - A3313, Computerworld
Box 880, Framingham, MA 01701
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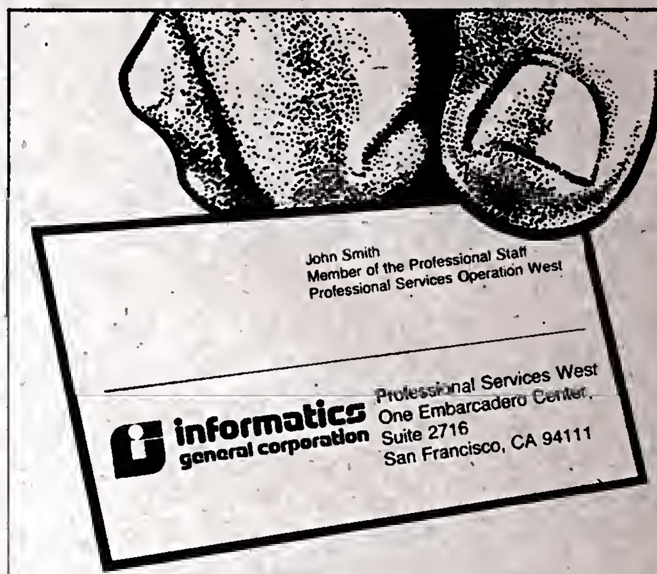
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Member of the Professional Staff
Professional Services Operation West
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Professional Services West
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Suite 2716
San Francisco, CA 94111

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Are you qualified to become a Member of the Informatics Professional Staff? If you're a top performer in a large IBM environment with a background in COBOL, VM/CMS and FOCUS, you're definitely going in the right direction.

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Consider the satisfaction of high-level challenge at Informatics. Send your resume to Informatics General Corporation, Professional Services West, Suite 2716, Room 882A, One Embarcadero Center, San Francisco, CA 94111. We are an equal opportunity employer.

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Our state-of-the-art environment consists of an HP-3000 series III and 64, 370/158, 168-AP, and a 3033.

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We offer competitive salaries and compensation/benefits package. For immediate consideration, please send your resume, including salary history and requirements, in confidence to:

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Corporate Staffing
BAUSCH & LOMB
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This is a unique opportunity for a key position with a high gross company. We offer career potential with a fast growing company. Benefits include excellent base salary, incentive plan, stock options, major medical and dental program. Please send resume in complete confidence to:

Barbara Goodman
Intelligent Systems
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The Hertz Corporation

Attn: Ned Oistacher
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Hertz

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Worcester, MA 01608
(617)798-0116

COMPUTER PROGRAMMER/ANALYST

The City of Dubuque, Iowa has a position available for an experienced programmer trained in performing systems analysis. The successful applicant must be able to analyze, design and document projects and coordinate the programming of an interactive on-line database oriented MIS. COBOL proficiency is required. Experience and familiarity on a Burroughs system is desirable. The successful applicant shall also possess a degree in computer science or related field, or an equivalent combination of education and experience that would provide the necessary knowledge, skills and abilities. Salary range for this position is $19,843 to $23,982, with a beginning salary commensurate with qualifications. The City of Dubuque also offers a complete benefit package. Interested applicants should submit an application or resume by September 7, 1982 to the Personnel Manager, City Hall, 13th & Central St., Dubuque, IA 52001.

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We are seeking professionals with 5 years experience in data base/data communication applications and at least 2 years of solid IDMS DB/DC experience.

If you would like to advance your career, join the professional services leader. Send your resume to:

John T. Nitterauer
Director, Recruiting
Computer Task Group
800 Delaware Avenue
Buffalo, NY 14209

CTG

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Data Base Administrator

White Stores Inc. Retail Hardlines chain located in Wichita Falls, Texas is seeking an experienced data base manager. Successful candidate will have 7 years DP experience, including 2 years data base administration. Must be able to design and maintain the logical and physical structure of an IMS DB/DC data base. Responsibilities include recovery utilities, tuning, implementation, and application development support. This new position reports directly to MIS director in a large scale OS/MVS environment. Whites offers excellent compensation and benefit package. Send confidential resume and salary history to:

White Stores, Inc.
3910 Call Field Rd.
Wichita Falls, TX 76308
Attention Russell Crawford
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As a major division of Tenneco, Newport News Shipbuilding is one of the world's largest and most diversified shipyards--and a national leader in marine engineering and design of innovative defense technology for the 80's.

We're expanding our CAD/CAM computer network to support and integrate the activities of 20,000 design, engineering and production personnel...and meet the needs of Naval/commercial contracts with values up to $1.2 billion.

That means outstanding growth opportuntities for CAD/CAM Systems Developers in the following areas:

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Must have four years experience in developing and implementing manufacturing production scheduling systems. Knowledge of simulation and modeling techniques, data collection, control systems, IBM and DEC mini's needed.

COMPUTER AIDED PROCESS PLANNING

Experience in CAPP implementation, group technology, parts coding and classification in both engineering and manufacturing areas is required. Should be familiar with MIPLAN or similar package, IBM 4341 mainframe and DEC mini's.

COMPUTER GRAPHICS & NUMERICAL CONTROL

At least three years experience with machine shop systems required. Knowledge of APT, NC programming, post processes and computer graphics necessary.

Experience with CADDS 4 system desired.

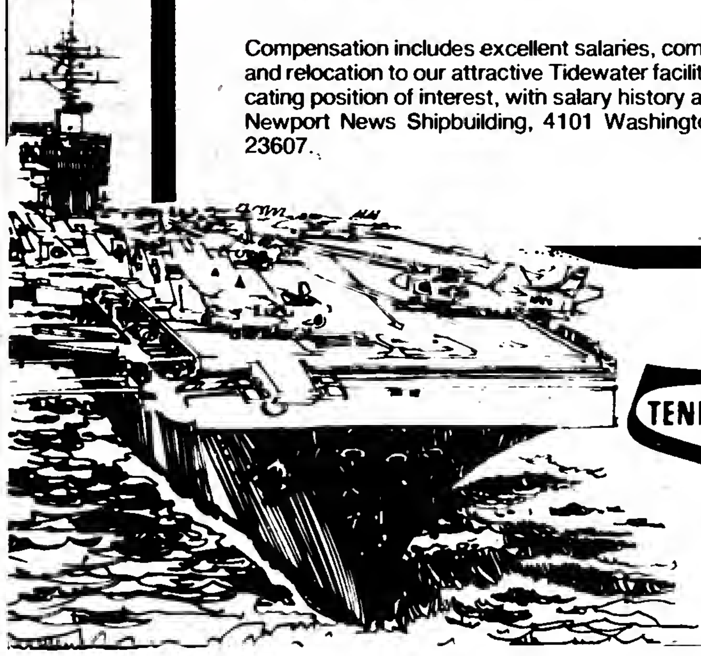
STRUCTURAL DESIGN AND FABRICATION

Should have minimum of two years experience in software development for structural design and production assembly areas. Strong user/vendor interface required.

DATABASE ANALYST

Interpret user requirements and establish database design for engineering/manufacturing environment. Minimum four years experience in database development and online processing with excellent grounding in commercial DBMS software and data dictionary/directory implementation. Some IMS DB/DC experience helpful.

Compensation includes excellent salaries, comprehensive benefits, dental plan, and relocation to our attractive Tidewater facilities. Please forward resume, indicating position of interest, with salary history and requirements to: Mr. L. Peek, Newport News Shipbuilding, 4101 Washington Avenue, Newport News, VA 23607.



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One of the world's largest software companies, based in Cincinnati, Ohio, is seeking experienced people to manage the bringing of new manufacturing systems modules to market and then provide continued support, once installed. Functions of the position are: the supervision of final testing, preparation of marketing and educational materials, and the education of customers and other concerned internal personnel. In order to perform these functions, a highly qualified individual is required with a number of years in customer environment, working with manufacturing systems. Previous knowledge of the existing products would be an additional plus.

Other requirements are:

- knowledge of the following systems:
  TOTAL, T-ASK, MRPS, MMPS, MPSS, PPCS, VAPS, TIS, LMS-II; IBM: BOMP, IRP, MRP, IPICS, MAPICS; NCA; MS-II, CSC; FLARES; Financial Modeling
- At least 4 years experience in related field
- 2 years college or equivalent

Salary: $29,750 per year.

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We have immediate requirements for additional Analysts on projects involving all phases of software development for manufacturing automation—concept development, specification, design, implementation.

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- **Manufacturing/Engineering Data Base Management**
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Openings are available for those who have developed large software systems and understand manufacturing operations/terminology. Individuals experienced with software development for factory automation will find attractive opportunities to upgrade their responsibilities and income.

Requirements include extensive FORTRAN experience and a Bachelors' or Masters' Degree in an appropriate discipline. Familiarity with one or more of the above project areas will be a definite plus.

For immediate consideration, call Mr. Marcin **collect** at **(203) 727-7110.** Or send your resumé to Mr. W. M. Marcin at the United Technologies Research Center, Silver Lane, East Hartford, Connecticut 06108.

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Here is an opportunity to direct the marketing activities of a dynamic computer systems manufacturer with a proven record in state-of-the-art breakthroughs, technical excellence and product reliability. You would be based in a prominent sunbelt location with all of its recognized advantages.

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A generous compensation package, including a results-oriented incentive plan and an excellent benefits plan accompany this position.

If your educational background and career activities have prepared you to move up and into a key marketing management opportunity, we should share additional information. Start by sending your resume, including current salary, in complete confidence to:

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Mr. Carroll Satterfield, VP
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Houston, TX 77079
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SR. SYS. ANAL. $35,000 RANGE

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Sunbelt financial institution; banking systems to include DDA, credit card, or CPCS from MVS environment.

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EDP AUDITOR $26,000

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All Fees Assumed by Client Companies
Contact Jim Morgan/Don Clement/Bill Renfrow

Executive Personnel Consultants
A General Services Company
606 South Mendenhall at Poplar
Memphis, Tennessee 38117
(901) 761-4560

EOE M/F/H

SENIOR DATA BASE ANALYST

Our growth is on your side...

The Arbitron Ratings Company, one of the nation's leading radio and television audience measurement firms, has a new position in a newly created data management section. Business growth, evolution and conversion to new generation hardware has created this opportunity for an aggressive, talented individual to function as a member of the technical staff of the Data Administrator. Will be a key participant in the design and implementation of DBMS and data dictionary systems. The individual we are seeking must have:

- **A degree plus 6-8 years experience in COBOL and data base applications as well as data dictionary implementation.**
- **Good writing skills and experience interfacing with users.**

Join a leader and take advantage of this outstanding career opportunity. We offer excellent benefits and a convenient suburban location. Qualified candidates should send resume with salary requirements to:

J. Orange
Personnel Administrator
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a Control Data Company
4320 Ammendale Road • Beltsville, MD 20705

An affirmative action employer

ATLANTA PROJECT LEADERS

Our 3081/3033 client has immediate need for Project Leaders to head up new development teams in the financial application area. To qualify you must have at least 10 years of programming/design experience and 2 years+ of project management in a structured environment. Must have had hiring and firing, budget, deadline responsibilities. Must have heavy IBM background.
For further information contact:

George Bostick
Lyman Personnel
3100 Timmons, Suite 300
Houston, TX 77027
(713) 627-1110

DATA COMMUNICATIONS MANAGER

West central Florida data comm company needs experienced manager to direct its application engineering effort. Successful candidate will have recent experience in planning, procuring, implementing, and managing data comm networks for medium-size organization.
Relocation to Florida with competitive salary, incentive, and benefits package. Send resume and salary requirements to:

Reply to CW-A3317
Computerworld
Box 880, Framingham, MA 01701

Electronic/Computer Science Faculty

Faculty position in electronics/computer science technolgy available immediately. Two year community college in the foothills of the Smokey mountains and 45 minutes from the World's Fair desires professional to enhance course offerings in microprocessor technology, process control systems, and other electronic applications. A minimum of two years industrial or military electronics/computer work experience is required. Master's preferred, Bachelor's required. Experience in teaching in micro/personal computing desirable. Salary negotiable. Send Resume to:

PERSONNEL OFFICE
WALTERS STATE COMMUNITY COLLEGE
Morristown, TN 37814
Application Deadline September 7, 1982
Equal Opportunity/ Affirmative Action Employer

SYSTEMS PROGRAMMER

Mutual Savings Life Insurance Company is seeking a Systems Programmer with a proven record who will take responsibilty for: complete system maintenance including OS/VSI, CICS, ACF/VTAM, and miscellaneous program products. Minimum of 2 years systems experience including Sysgens, SMP4, and problem determination. We offer a competitive salary based on qualifications and experience and a comprehensive benefits package. We are located in a mid-size southeastern city. For confidential consideration, send a detailed resume including salary history and requirements to:

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Mutual Savings Life Insurance Co.
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ST. LOUIS

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Suite 105
St. Louis, MO 63132
1-800-325-4802

...Your professional career guide

SYSTEMS PROGRAMMER

La Serena, Chile

Cerro Tololo Inter-American Observatory, the largest US operated ground-based optical astronomical observatory in the southern hemisphere, has an immediate opening for a Systems Programmer with experience in modifying Data General's RDOS, RTOS, and AOS/VS operating systems to run in non-standard environments. Our equipment includes a network of eight Data General Eclipse computers for instrumentation control and an Eclipse MV/8000 computer for data analysis.

The requirements include a degree (Bachelor's or Master's) in astronomy, physics, or computer science and a background in scientific programming, interactive data analysis, or real time instrument control, as well as experience in the Data General Systems mentioned above.

CTIO headquarters and housing area are located in La Serena, Chile, a pleasant coastal city in a mild climate about 300 miles north of Santiago. Observing facilities include the 4 meter telescope (the largest in the southern hemisphere), a 1.5 meter, a 92-cm., a 61-cm., Schmidt and two 40-cm. telescopes. Base salary is competitive with U.S. positions plus overseas allowance and tax benefits totaling about 50%. Liberal benefits and good living conditions.

Please send resume, in confidence and including salary history to: Judith Ruffino, Personnel Manager, P.O. Box 26732, Tucson, AZ 85726.

an affirmative action/equal
opportunity employer

CENTRAL TEXAS

Systems Analyst - Salary Open

Degree preferred, not required. Co. has need for sys/anal with the following qualifications: Must: 3+ yrs-COBOL, lge IBM OS/VS, IMS, Ins-Fin appls, DB/DC or TOTAL or FOCUS, etc. Plus's are PL/1, JES2, JES3, new sys devel. If you are interested in a visible, fast growth/earnings position, contact:

Bob Baldauf

ROBERT HALF
of San Antonio, Inc.
8243 I H 10 West, #850
San Antonio, TX 78201
1-800-531-5402
In Texas, Dial (512) 736-2467

SYSTEMS PROGRAMMER

Jewish Hospital has an opening for a Systems Programmer in its hospital information service. This position performs a variety of computer related services in the areas problem solving and evaluation of hardware and software. Must be a graduate of a technical school in data processing. Two years systems programming experience with emphasis in operating systems, telecommunications and data base management required. DOS/VS (E) systems generation and DOS/VS (E) CICS systems generation experience required.

For Information Contact:
Rick Hutchison
Personnel Services
Jewish Hospital
(502)587-4233
217 East Chestnut St.
Louisville, KY 40202

An Equal Opportuntity Employer M/F/H, V

EDP MANAGER

Dynamic growing financial institution based in Carolinas seeking an EDP manager. Must have strong administrative and operational skills for an expanding installation that operates an on-line Burroughs medium system, supporting state wide branches and ATMs. High visibility, competitive salary and benefits are available for experienced administrator. Send resume along with salary history to **P.O. Box 32607, Attention EDP Search, Charlotte, NC 28232.**

EOE

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If you stop reading now, you may short circuit your career in computers.

At Kodak, steady corporate growth and diversification mean we have tremendous opportunities for computer professionals.

Opportunities in areas as diverse as process control, manufacturing and administrative systems, and support technologies. Development of business systems and photographic and medical products. Modification of support software such as MVS, IMS, TSO, VM, RSTS/E, RSX-11/M, RDOS, INFOS, and AOS. And in building Kodak's own software systems.

Our needs are growing steadily, so there's plenty of potential for you to grow, too.

If you think you'd thrive facing the daily challenges you'll find at Kodak, call us toll-free at (800) 828-6541; or, if you live in New York State, call us collect at (716) 724-4605. Or send your resume to: Personnel Resources, Eastman Kodak Company, Dept. C-82 Rochester, N.Y. 14650.

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An equal opportunity employer manufacturing photographic products, fibers, plastics, chemicals, and electronic equipment. Plants in Rochester, N.Y.; Kingsport, Tenn.; Windsor, Colo.; Longview, Tex.; Columbia, S.C.; Batesville, Ark.; and a sales force all over the U.S.

IMS DATA BASE SPECIALIST

Join an established data base administration group. Duties include:

- Designing and implementing all new data bases
- Maintaining and tuning existing data bases
- Providing general assistance and technical support to the application development area (no direct application programming responsibilities)

The company, located in the lovely piedmont area of North Carolina, is a heavy user of IMS DB and DC. We offer opportunity for rapid career advancement with excellent benefits.

Requirements: 2 plus years IMS experience, college degree.

Send your resume and salary history to:

Reply to CW-A3315
Computerworld
Box 880
Framingham, MA 01701

All replies will be strictly confidential.
An Equal Opportunity Employer

PROGRAMMER/ANALYST

Duties:
Implement/Monitor - Operating system, various programming languages, telecommunications network. Consultant to Applications Programmers.

Education:
(Desired) BA/BS in appropriate field
(Minimum) AS in appropriate field

Experience:
2 years with BA/BS; 3 years with AS

Languages:
COBOL + (at least one of the following) PL1, FORTRAN, ALGOL, DMSII, BASIC

Desired Background:
Database, on-line systems, telecommunications, Burroughs large systems.

A challenging "state of the art" position; freedom to grow technically; excellent fringe benefits. Salary to mid 20's.

Send letter and resume to:

Office of Faculty
and Staff Relations,
4th Floor Administration Building
SUNY College at Brockport
Brockport, New York 14420

Deadline for application:
Friday, September 24, 1982

The SUNY College at Brockport
is an EEO/AA Employer.

Data Processing Manager

Fast growing Dallas, Texas Computer Library Services Company requires individual to manage its' data processing facility, including all information system product development and data base services. Specific responsibilities include: supervision of computing staff, budget preparation and expenditure control, technical support, hardware and software evaluation, and marketing of services and products.

Successful candidate will have demonstrated leadership ability to plan, organize, and carry out the managerial work of a total computer operation. Position requires 5-8 years experience with on-line and Batch systems and minicomputers. Familiarity with library computer systems and Tandem computers is desirable.

Send resume and salary history to:

AMIGOS Bibliographic Council
11300 N. Central Expressway
Suite 321
Dallas, Texas 75243

CALIFORNIA STATE UNIVERSITY, CHICO
Invites Nominations and Applications
for the Position of
DEAN OF INFORMATION SERVICES
Available January, 1983

The Dean of Information Services coordinates and directs the Information Services units (University Library, Computer Center, and Instructional Media Center) and the administration of all aspects of the University Library. These units are integrated into an administrative entity serving 14,000 students and 1,700 faculty and staff. Candidates must hold a graduate degree from an ALA-accredited school and an additional graduate degree (with strong preference for the doctorate) and should be able to document a history of effective leadership, creativity, achievement, and commitment to affirmative action. Candidates should have administrative experience in libraries and other information service areas.

California State University, Chico, located 100 miles north of Sacramento, is a comprehensive university, the second oldest in the state system, and attracts a cosmopolitan and diverse student body.

Request for an expanded job description, as well as applications and nominations, should be addressed to:

Dr. Gerda Seaman, Chair
Dean of Information Services
Selection Committee
Office of the Vice President
for Academic Affairs
California State University, Chico
Chico, California 95929

Dealine for applications and nominations
is September 10, 1982.

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500% increase in employment in only 6 months—and that's only the beginning! Come join a company that is really going places!

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GROUP LEADER—CPU Designs

5-8 years' experience designing CPU systems.

GROUP LEADER—Communications Design

5-8 years' experience designing communications controllers. ASYNC, BISYNC, HDLC and Networks.

GROUP LEADER—ATE

5-8 years' experience developing test methods and programs for computer systems and peripheral controllers.

PROGRAMMERS—ATE

2-3 years' experience developing programs for testing digital logic circuitry.

STANDARDS ENGINEER

3-5 years' experience in standardization procedures involved in electronic computer manufacturing. Working knowledge of UL, CSA, FCC and VDE regulations required.

TECHNICAL WRITERS

3-5 years' experience in documenting both computer hardware and software systems. Must be able to produce technical publications.

DOCUMENTATION SPECIALIST

3-5 years' experience in the implementation and control of product documentation for computer hardware and software.

In addition to excellent salaries and benefits, our future plans and promotional policy combined with significant equity participation and long-term growth potential make for a package which career-oriented professionals ought to explore thoroughly. To find out more about what we have to offer each other, forward your confidential resume, including indication of specific position in which you are interested and salary requirement to: ***Samuel Freedman, Director, Human Resources, Department C830, Parallel Computer Systems, Inc., 210 Sylvan Avenue, Englewood Cliffs, New Jersey 07632.*** *We are an equal opportunity employer.*

PARALLEL
COMPUTER SYSTEMS, INC.

Computer Programmers

Stanford University, an acknowledged leader in computer technology, has an ongoing need for programmer/analysts and programmers in scientific, systems, and business applications at the Medical Center, the Center for Information Technology (CIT), the Research Libraries Group (RLG), and other groups on campus.

Stanford is organized into several divisions to provide planning and support in computing and information systems for instruction, research, administrative, office systems, and hospital patient care. These functions utilize a variety of equipment requiring expertise in three or more of the following areas: COBOL, FORTRAN, PASCAL, APL, text processing, database management systems. Required hardware and software knowledge includes large IBM systems, DEC, minis/micros, WYLBUR, MARK IV, SPIRES and HASP. Years of experience required are based on position level, generally ranging from 2 to 8 years.

Stanford University offers a liberal benefits package, along with the cultural, educational and recreational advantages of working on campus. Salary is commensurate with experience.

To apply, send an application/resume, including salary history to: Stanford University, Personnel Dept.-CPU, ATTN: Art Wilson, Stanford, CA 94305. An equal opportunity employer through affirmative action.

Stanford University

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St. Petersburg, Florida

Engineering Documentation Systems Specialist
Assist in implementing CAD/CAM plan. Must know DMCS software for distributing graphics, change control and NC model data to minicomputer system.

HARDWARE/SOFTWARE SPECIALISTS

MANUFACTURING SYSTEMS ANALYSTS

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SANTA FE
DP OPPORTUNITIES FOR PROFESSIONALS

Santa Fe, New Mexico, nestled against the foothills of the Southern Rockies, has been rated as one of the most attractive places to live in the country. With a mild climate, this growing city is rich in history, culture, sunshine, artistry, and possesses unsurpassed southwest charm. Fishing, hunting, sailing, skiing and many other recreational activities are only minutes away.

The State of New Mexico's central computer installation, located in Santa Fe, is recruiting DP professionals to support its 3033 and 158 processors. Openings exist in Systems Management, Systems Software, and Applications Development.

Housed in a state of the art facility constructed especially for data processing, the center provides services to over sixty agencies via a statewide network with 600 devices. Opportunities exist for experienced applicants with leadership ability and knowledge of large IBM mainframes.

Applicants for VM should have extensive knowledge of VM and assembler. Applicants for network support shold have extensive knowledge in ACF/VTAM with MSNF and ACF/NCP. Applicants for MVS should have extensive knowledge of MVS, NJE and TSO. Application Analysts should have experience in designing large on-line systems with an understanding of DBT. Systems Software Manager applicants should have supervisory experience, inter-personal skills, as well as technical knowledge.

We offer competitive salaries, excellent benefits, optional four day work weeks, state of the art technology, and fresh air.

For immediate and confidential consideration, please contact or submit your resume to **Marlin Mackey, Deputy Director, Automated Data Processing Division, 715 Alta Vista, Santa Fe, New Mexico 87503 (505-827-3271).**

DFA IS AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER M/F/H

Computer Services

Plymouth State College is seeking an individual to work in the academic side of Computer Services to: 1) prepare and conduct training seminars on the uses of computers, 2) assist in design, purchase, implementation, and maintanence of applications for academic users, 3) prepare software documentation and/or hardware enhancements. Requirements; BA/BS in related field and one year experience, ability to communicate effectively, work with details and to think logically and analytically. Also desirable is familiarity with DEC PDP11, UNIX operating system, and microcomputers. Position is scheduled to be academic year (10 months) though year-round employment may be possible. Normal starting salary for 10 months $13,000 to 15,600. (to $18,650 for full year appointment). **Send resume to R. Kleinpeter, Box E, Plymouth State College Computer Services, Plymouth, N.H. 03264, by Sept. 10th.**

AA/EOE

RPG III PROGRAMMER NEEDED IMMEDIATELY

Must be fluent in RPG III, CL, CPF, and DDS for IBM System 38. Working knowledge of RPG II on Systems/34 required. Good benefits and salary to 40K for the right person. Must be willing to relocate to Fairbanks, Alaska and join a rapidly growing state-wide consulting firm.

Respond to
Data Management Inc.
P.O. Box 74383
Fairbanks, AL 99707

Software Systems Specialist

A large retail distributor has an opening for a software systems specialist to be responsible for the maintenance and documentation of various internal data center utiltity programs and routines. Will also be responsible for installation, testing, implementation and maintenance of selected program products. Finally, must assist in planning and generation of the MVS operating system.

Minimum requirements M.S. in Computer Science, complete knowledge of Assembler and Cobol languages and macro-writing, complete knowledge of teleprocessing concepts utilizing CICS and VSAM coding techniques. Salary: $24,900.

Send resume to: MINAFLOR, Ms. Jaskowiak, Illinois Job Service, 910 South Michigan Ave., Ste. 400, Chicago ,IL 60605, Ref. #9294-J.

RSX-11M
Systems Programmer
Dallas Texas

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We are adding a Senior Systems Planner to our Advanced Systems Planning Department to ensure that our planning activities stays up to date with the rapidly changing technologies that will continue throughout the 1980s. The Senior Systems Planner will develop five-year information systems plans to meet the information requirements of our expanding business and to exploit new data processing and data communications technologies. You will evaluate specific opportunities for the introduction of new technologies for meeting the needs of our business, and where appropriate, will establish innovative pilot test systems to evaluate the use of these technologies in user operations.

A thorough knowledge of advanced business systems applications is required. A five year background in systems planning in a large scale MIS environment with exposure to data communications, distributed processing, and DBMS is prerequisite. Good oral and written communicative skills are needed to work effectively with middle and upper management levels.

The salary offered is very competitive and the benefits are all inclusive. Send your resume with salary history to: **Mr. Frank Lewis, Recruiter, Professional Employment (CW), Pitney Bowes, Walter H. Wheeler, Jr. Drive, Stamford, CT 06926.**

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Personnel Recruitment Department

TANO

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DATA PROCESSING MANAGER

Unique opportunity to manage OS/3 shop using RPG II, Cobol 74. Position requires Bachelor's Degree or equivalent and extensive experience in IMS, ICS, OS/3. We offer competitive salary and superb professional advancement opportunity.

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AIRLINE EXECUTIVE

GENERAL MANAGER — DATA SERVICES

Monthly Salary $5016 Tax Free*

Saudia is one of the world's fastest growing international airlines, which now operates over 60 modern jet transport aircraft to major cities in Asia, the Middle East, Europe and North America. This growth is being supported by an expanding data processing function at the airline's Jeddah headquarters. The processing power of multiple 30XX IBM computers is provided to all functional areas of the airline.

POSITION DESCRIPTION

The General Manager — Data Services is responsible for all of Saudia's data processing activities. This responsibility includes the direction and control of the computer center and system development activities, as well as the planning for Saudia's future data processing needs. The airline is embarked on an ambitious Information System Plan, providing computer support to virtually all areas of airline operations. A hosted reservations service and purchased software packages (flight schedules, operations control, crew management, materials management, and accounts payable) are being supplemented by in-house development projects for financial planning and technical information systems.

REQUIREMENTS

A minimum of ten years data processing experience with large-scale IBM systems, and at least five years of results-oriented senior management or officer level responsibilities with an airline. College graduate preferred. Exceptional leadership qualities.

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Car furnished • Free furnished air-conditioned housing and utilities • Paid medical insurance • 30 day vacation with positive space travel for family to and from domicile • Free or reduced rates on Saudia and other airlines • Retirement program (social insurance after 15 years service) • Household shipment from domicile to Saudi Arabia and back • K-9 schooling for children — out of Kingdom financial assistance for other grades • Annual service increase and eligibility for yearly merit bonus based on performance.

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SOFTWARE QUALITY ASSURANCE ENGINEERS—Independent, objective validation testing is Sperry's technique for improving software quality. You'll participate in real-time validation test planning, generate specifications and procedures, and conduct tests. At least 3-5 years experience and knowledge of digital computers, peripherals and programming essential. Experience in tactical radar software development and test highly desirable. BS in Engineering or Computer Science.

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Candidates must be knowledgeable in the latest advances in information processing technology and be able to build and maintain relationships with senior information systems professionals and operations executives.

Excellent verbal and written skills are required. Travel up to 30%. BSEE, MBA, or equivalent education level is required.

Competitive salaries and company paid benefits program.

Send resume with salary requirements. in confidence, to:

CW-A3314, Computerworld Box 880
Framingham, MA 01701

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PROGRAMMER/ANALYST

We are looking for a Programmer/Analyst to join our Systems & Programmer Staff. Candidates should have no less than 2-3 years of experience on IBM hardware (ideally 3033) with excellent Cobol skills in an OS/VS or OS/MVS environment. We strongly prefer CICS with TSO as a plus. Our very challenging and progressive attitude will allow personal impact on the direction of our application systems development. We offer a competitive starting salary, benefit package and a realistic relocation policy. Please forward your resume with salary requirement to Scott C. Stevens.

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SYSTEMS ENGINEER

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William J. Mills, Manager Classified Advertising

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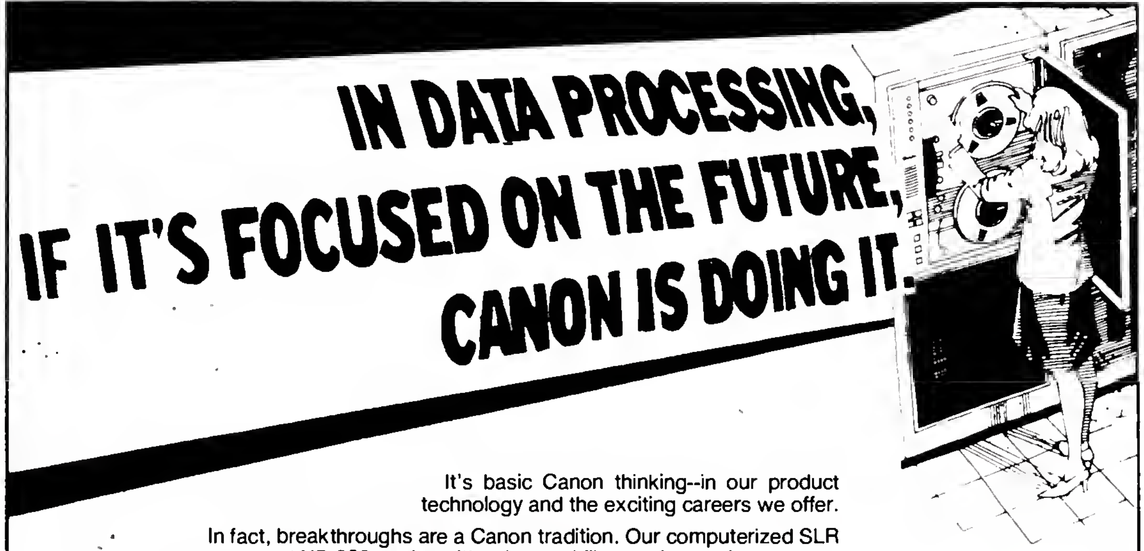

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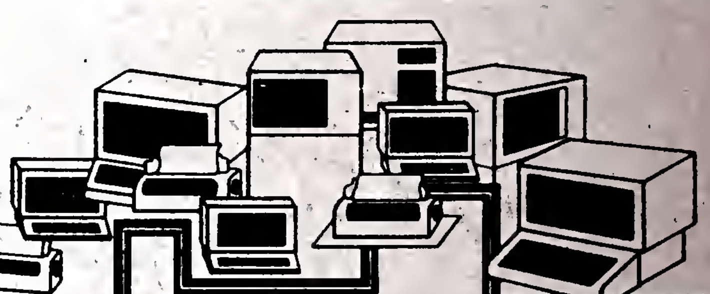

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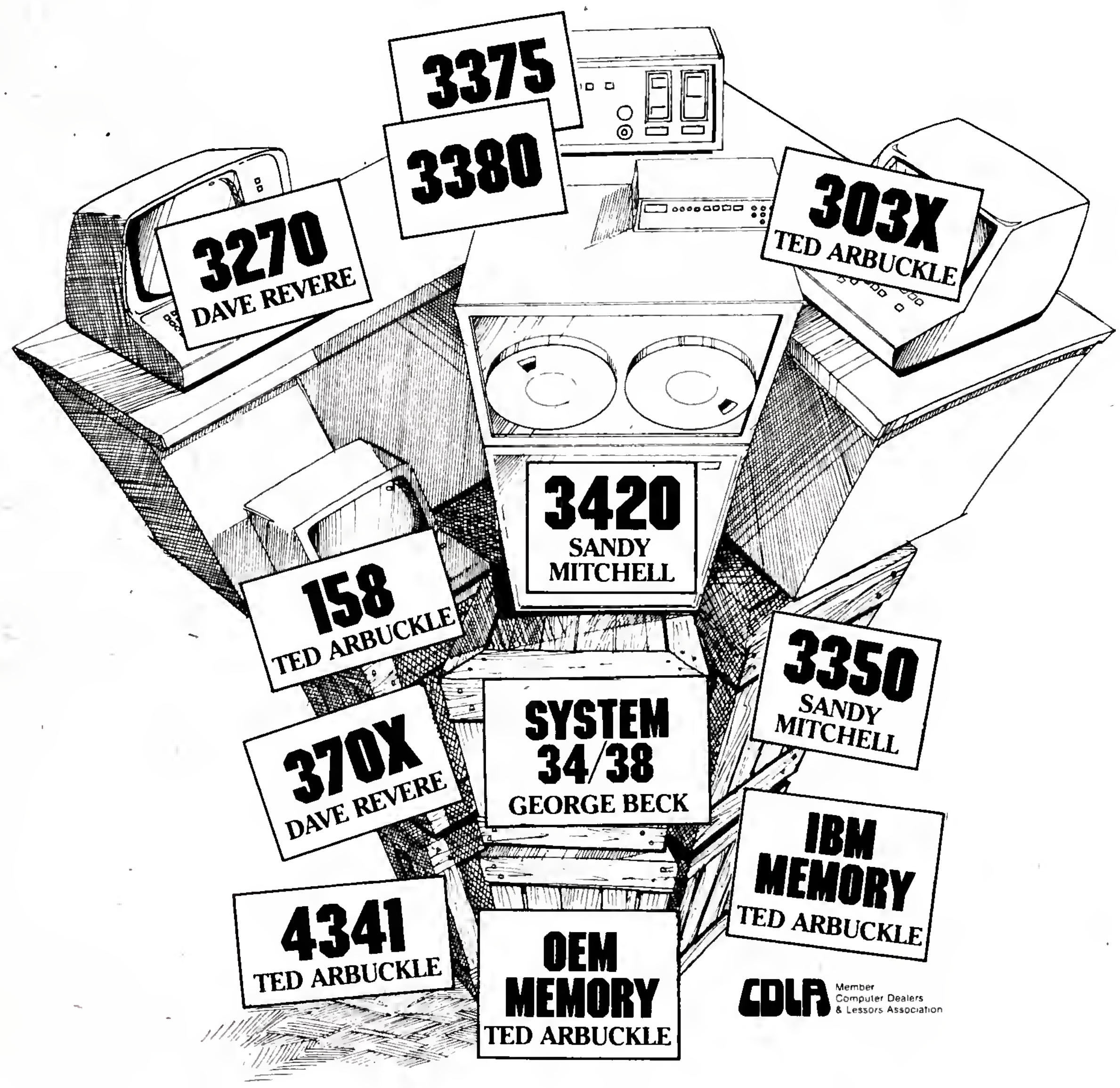

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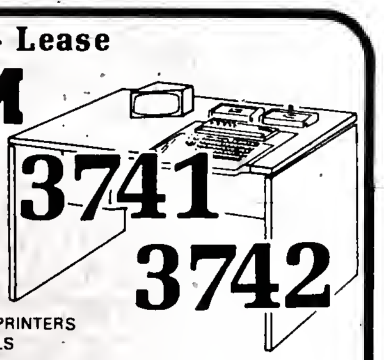

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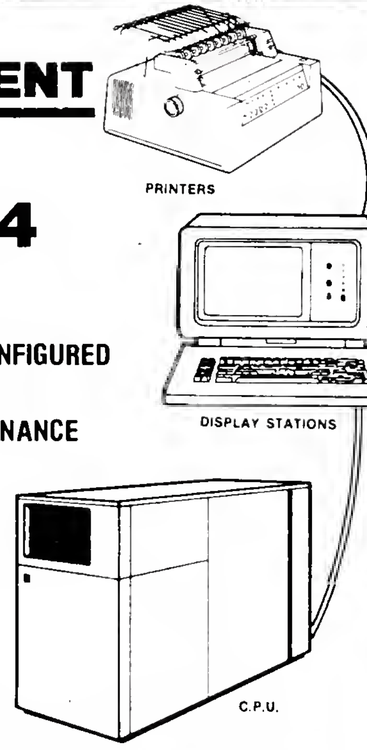

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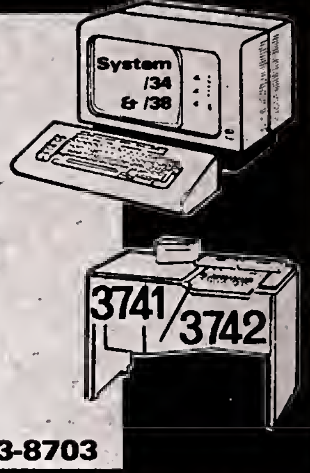

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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

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Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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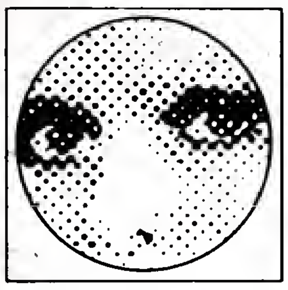

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The open line rate is $6.95 per line and there is a minimum size of 1 column by 2" at a cost of $194.60. We can accomodate up to 5 columns and depth measurement increases by half inch increments.

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Computerworld comes out every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First-time advertisers must send payment along with their first ad.

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ADVERTISERS' INDEX

Academic Software Systems	67
Advanced Electronic Design	83
Alpha Micro	SR/6-SR/7
Altos Computer Systems	66-67
Applied Computer Research	16
Applied Data Research	3
Applied Digital Data	61
Arkay Computer	51
Atlas Energy Systems	6
Az-Tech Computer Systems	16
Babb Computer Associates, Inc.	76
Barber, Glenn A. & Associates	76
Beehive International	68
Black Box Catalogue	8
BMC Software	SR/29
Braegen Corp.	18
CCS Inc.	52
CGA	82
Circle Computer Services	11
Codex Corp.	SR/16
ComDesign	70
Communications Research	SR/10
Computer Center Associates	62
Computer Devices	SR/17
Computer Technology Group	33
Computerworld Extra	40
Computerworld Mexico	11
Computerworld Office Automation	64
CW Office Automation Forum	54
Computerworld Supplement	84
Continuing Education Institute	76
Control Data Corporation/MSD	32
Data General	56-57,78-79
Dataserv	25
Datasource Systems Corp.	23
Datasouth Corp.	22
Data Systems Marketing	SR/13
Data Technology Industries	80
Dataware, Inc.	44
Datec	12
D.B. Systems, Inc.	66
Decision Data Corp.	53
Delphi Data Systems, Inc.	20
Digital Equipment Corp./Networking	42-43
DTSS/Tempo	13
Dysan Corp.	SR/8-SR/9
Falco Data Products	SR/27
Florida Computer Graphics	58-59
Fusion Products	50
Graham Magnetics	41
Hewlett Packard/DTD	SR/4-SR/5
H & W Computer Systems, Inc.	18
IBM/ISG	77
IBM/SSD	48-49
IBM/VAR	SR/18-SR/19
Information Builders	26
Informer, Inc.	SR/25
Informatics-Educational Division	SR/28
Infoworld	14,35,52
Innovation Data Processing	9
Intertec Data Systems	29
K/W Controls	24
Lanier Business Products	SR/14-SR/15
Lear Siegler	SR/22-SR/23
Lee Data	38
M/A COM-OSI	19
Martec International	SR/24
Martin Marietta Systems	47
MBP Software & Services Tech.	SR/8
MCBA	17
Media Systems Technology	SR/30
Memorex-Tape Division	30
Memorex	62
Microdata	SR/26
Modemsplus	76
MTI Systems	10
NEC Information Systems	SR/11,81
Onyx & IMI, Inc.	SR/33
Otrona Corp	75
Piiceon	31
Polygon Associates	52
Protocol Computers	SR/36
3R Computer, Inc.	15
Radgo Sales	4
Radio Shack	SR/31
Scitec Corp.	SR/20
Signal Technology	SR/8
Softmatics Corp.	SR/28
Software International	73
Southern Systems	110
Storage Technology Corp	60
Syncsort	7
Teleprocessing Products	28
Teleram Communications Corp.	46
Teleray Div./Research Inc.	34
Televideo Systems	20-21,50-51
Texas Instruments	SR/32
Texprint	21
Tone Software	14
The Trane Co.	70
Underwood Newhaus	70
United Information Services	SR/12
Universal Data Systems	74
U.S.Telecommunications & Supplies	45
Visual Technology	44
Wild Hare Computer Systems	SR/3
Xerox-Diablo	SR/21
Xerox-OPD	SR/34-SR/35
Yourdon	5

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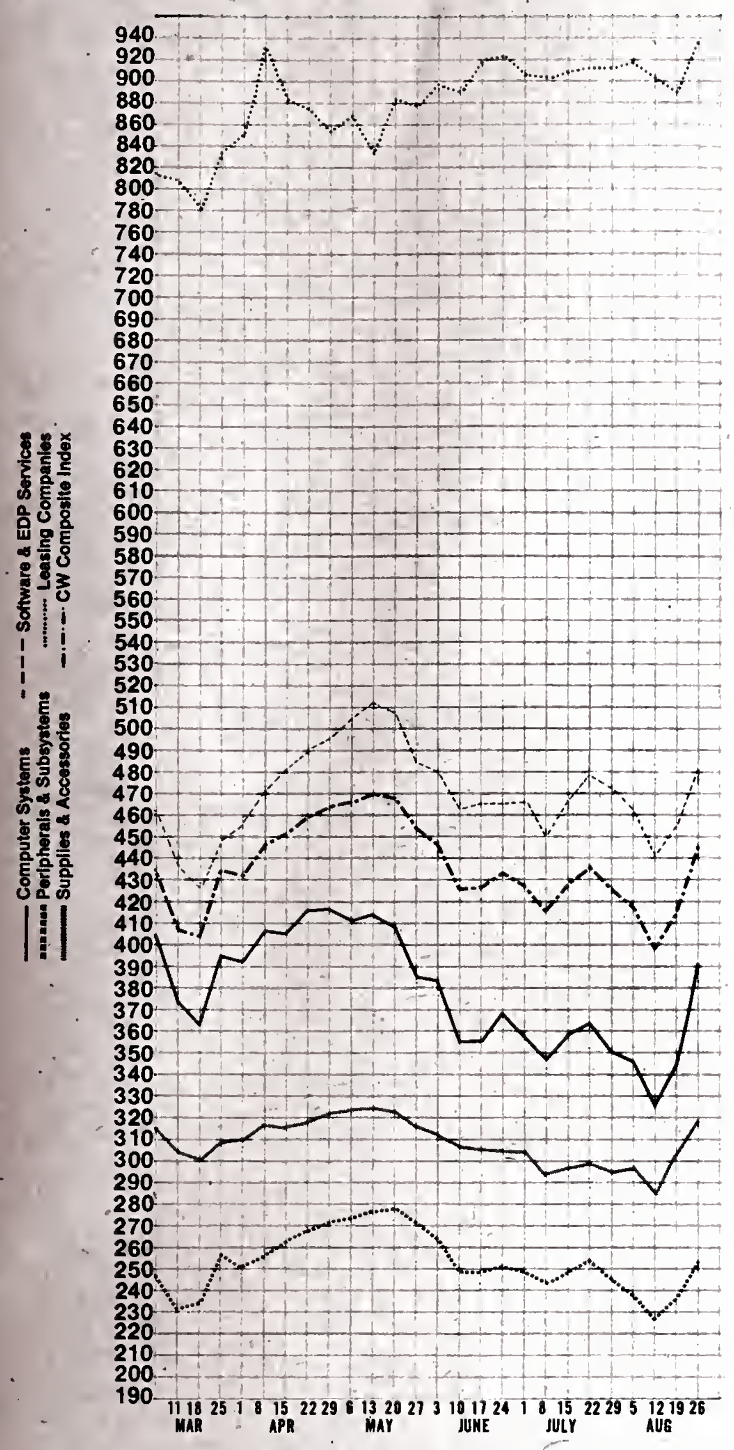
Computerworld Stock Trading Index



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 25, 1982

All statistics compiled, computed and formatted by
TRADE QUOTES, INC
Cambridge, Mass 02139

COMPUTER SYSTEMS

EXCH		PRICE 1981-82 RANGE (1)	CLOSE AUG 25 1982	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	18- 46	24 1/8	+4 3/8	+22.1
N	BURROUGHS CORP	28- 72	34 3/8	+2 1/4	+7.0
O	COMPUTER AUTOMATION	8- 28	8 5/8	+ 1/8	+1.4
N	CONTROL DATA CORP	19- 42	28 7/8	+4 1/8	+16.6
N	CRAY RESEARCH INC	20- 49	26 7/8	+4 1/8	+18.1
N	DATA GENERAL CORP	21- 87	27	+5 5/8	+26.3
N	DATAPOINT CORP	11- 68	15 3/8	+2 7/8	+23.0
N	DIGITAL EQUIPMENT	62-113	78 1/4	+10 5/8	+15.7
A	EECO INC	6- 19	6 7/8	+ 1/8	+1.8
N	ELECTRONIC ASSOC.	5- 13	8 3/4	+ 1/2	+6.0
N	FLOATING POINT SYST	13- 30	22 3/4	+3 5/8	+18.9
N	FOXBORO	22- 62	26	+3 1/4	+14.2
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 16	3 3/8	0	0.0
N	HARRIS CORP	21- 60	27 1/8	+3 3/8	+14.2
N	HEWLETT-PACKARD CO	33- 54	48	+6 3/8	+15.3
N	HONEYWELL INC	60-115	72	+9	+14.2
N	IBM	49- 73	69 1/8	+3 3/8	+5.1
O	IPL SYSTEMS INC	5- 13	4 1/2	- 5/8	-12.1
O	MAGNUSON COMP SYSTS	2- 32	2 3/4	+1 1/8	+69.2
N	MANAGEMENT ASSIST	7- 26	9 5/8	+ 1/2	+5.4
O	MINI-COMPUTER SYST	0- 4	3/8	0	0.0
N	MODULAR COMPUTER SYS	7- 32	8 1/4	+ 5/8	+8.1
N	MOHAWK DATA SCI	10- 32	14 3/8	+2 3/8	+19.7
N	NCR	39- 78	59 3/4	+4 7/8	+8.8
N	PERKIN-ELMER	17- 36	20 3/4	+2 1/4	+12.1
N	PRIME COMPUTER INC	16- 49	21 1/2	+3 3/8	+18.6
N	SPERRY CORP	21- 65	24 3/8	+2	+8.9
O	TANDEM COMPUTERS INC	13- 35	21 3/8	+4 1/2	+26.6
N	TEXAS INSTRUMENTS	71-151	89	+5 5/8	+6.7
A	WANG LABS "B"	24- 37	31	+5	+19.2
A	WANG LABS "C"	21- 32	32 3/8	+8 1/4	+34.1

LEASING COMPANIES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE AUG 25 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	18- 29	22 1/4	0	0.0
N	COMDISCO INC	15- 27	18 1/4	+1 1/4	+7.3
B	COMMERCE GROUP CORP	1- 1	1/2	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	4- 9	8 3/4	+1	+12.9
N	DPF INC	5- 13	9 3/8	+1 3/8	+17.1
O	ITEL	1- 5	5/8	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	27 1/4	+2 1/8	+8.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE AUG 25 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	1 1/2	+ 1/4	+20.0
O	ADVANCED SYSTEMS INC	9- 15	9 1/2	- 1/4	-2.5
O	AGS COMPUTERS INC	7- 10	9	+1 1/4	+16.1
O	ANACOMP INC	10- 19	11 3/8	+1 1/8	+10.9
O	ANALYSTS INTL CORP	3- 14	7	0	0.0
A	APPLIED DATA RES.	13- 25	23 5/8	+ 5/8	+2.7
O	ASK COMPUTER SYSTEMS	11- 17	15 1/4	+1 7/8	+14.0
B	ASTRADYNE COMP IND	1- 5	1 1/8	- 1/8	-10.0
N	AUTOMATIC DATA PROC	21- 32	23	+1 3/4	+8.2
O	CGA COMPUTER ASSOC	4- 25	6	+ 1/4	+4.3
O	COMPUTER ASSOC INT'L	12- 20	19 1/4	+ 3/4	+4.0
O	COMPUTER HORIZONS	1- 3	2 1/2	0	0.0
O	COMPUTER NETWORK	4- 9	6	- 1/4	-4.0
N	COMPUTER SCIENCES	11- 30	13 1/2	+ 3/4	+5.8
O	COMPUTER TASK GROUP	10- 23	9 1/2	- 1/2	-5.0
O	COMPUTER USAGE	2- 10	2 3/4	+ 1/8	+4.7
O	COMPUTONE SYSTEMS	12- 21	18 3/4	+2 3/4	+17.1
O	COMSERV CORP	9- 16	14	+1 1/2	+12.0
O	COMSHARE	6- 21	5 3/4	+ 1/8	+2.2
N	CULLINANE DATABASE	15- 37	32	+3 1/8	+10.8
O	CYCARE SYSTEMS INC	9- 14	9 3/4	+ 1/4	+2.6
O	DATA DIMENSIONS INC	1- 3	3/8	0	0.0
O	DATATAB	1- 4	5/8	0	0.0
O	DYATRON CORP	2- 11	2 7/8	- 5/8	-17.8
N	ELECTRONIC DATA SYST	15- 32	31 1/2	+4	+14.5
O	INFORMATICS INC	10- 23	11 3/4	+1 3/4	+17.5
O	INSYTE CORP	1- 3	2 1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	4	- 1/4	-5.8
A	LOGICON	12- 38	14 3/4	+ 5/8	+4.4
O	MNGT SCI AMER INC	17- 26	22	+ 3/4	+3.5
O	MATHEMATICA INC	8- 17	13	+ 1/2	+4.0
O	MATHEMATICAL APP GRP	12- 28	13 1/2	+2	+17.3
O	NATIONAL DATA CORP	13- 28	15	+1	+7.1
O	PANSOPHIC SYSTEMS	8- 15	10 1/4	+ 1/4	+2.5
N	PLANNING RESEARCH	5- 13	6 7/8	+ 5/8	+10.0
O	PROGRAMMING & SYS	1- 2	1 3/8	0	0.0
O	REYNOLDS & REYNOLD	16- 26	20 1/2	+1	+5.1
O	SEI CORP	17- 28	23 1/2	+ 1/4	+1.0
O	SHARED MEDICAL SYST	26- 37	34	+4 1/4	+14.2
O	STSC INC	6- 28	10 3/4	+ 1/8	+1.1
O	SCIENTIFIC COMPUTERS	6- 16	9	+1 1/2	+20.0
O	SOFTWARE AG	5- 23	7 3/8	+1 3/8	+22.9
N	TYMSHARE INC	13- 58	17 7/8	+ 5/8	+3.6
A	URS CORP	10- 18	10 5/8	+ 3/4	+7.5
N	WYLY CORP	7- 20	10	+ 7/8	+9.5

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1981-82 RANGE (1)	CLOSE AUG 25 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	1	0	0.0
A	ANDERSON JACOBSON	9- 26	11	+1 1/8	+11.3
O	AUTO-TROL TECHNOLOGY	8- 62	10 5/8	+ 7/8	+8.9
O	BANCTEC INC	7- 35	10 3/8	+2 7/8	+38.3
A	BEEHIVE INT'L	4- 18	6 1/8	+ 5/8	+11.3
A	BOLT, BERANEK & NEW	9- 25	15 5/8	+ 3/4	+5.0
O	CAMBEX CORP	2- 9	2 1/4	+ 1/4	+12.5
N	CENTRONICS DATA COMP	7- 40	7 1/4	0	0.0
A	CETEC CORP	4- 9	4 1/8	+ 1/8	+3.1
O	COGNITRONICS	2- 11	3 1/8	+ 1/4	+8.6
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	16- 28	24 3/8	+2	+6.9
O	COMPUTER DEVICES INC	4- 10	9 3/8	+ 1/4	+2.7
O	COMPUTER TRANSCEIVER	2- 9	4 1/4	+ 1/4	+6.2
N	COMPUTERVISION CORP	20- 49	24 7/8	+3 1/4	+15.0
N	CONRAC CORP	17- 28	26 3/8	+1 3/4	+7.1
A	DATA ACCESS SYSTEMS	2- 15	1 1/8	- 1/8	-10.0
A	DATAPRODUCTS CORP	16- 44	21 5/8	+3 1/8	+16.8
O	DATARAM CORP	4- 15	6 1/4	- 1/2	-7.4
O	DATUM INC	2- 5	1 3/4	+ 1/8	+7.6
O	DAVID JAMISON CARLYL	2- 7	2 5/8	+ 1/4	+10.5
O	DECISION DATA COMPUT	3- 6	5 5/8	+ 1/8	+2.2
O	DELTA DATA SYSTEMS	1- 4	1 3/8	0	0.0
N	ELECTRONIC M & M	3- 9	4	+ 1/9	+3.2
O	EVANS & SUTHERLAND	18- 40	26 3/4	+5 1/4	+24.4
N	GEN'L DATA COMM IND	7- 19	8 1/4	+1 3/8	+20.0
O	GENERAL TERMINAL CP	0- 4	1/4	0	0.0
O	GREAT SOUTHWEST IND	1- 12	3 1/4	+ 1/4	+8.3
N	HAZELTINE CORP	19- 35	26 3/4	-1 1/4	-4.4
O	INFORMATION INTL INC	8- 17	12 3/4	+ 1/2	+4.0
O	INTEL CORP	21- 51	34 3/4	+4 3/4	+15.8
O	IPL SYSTEMS INC	5- 15	4 1/2	- 5/8	-12.1
A	LUNDY ELECTRONICS	7- 19	11 1/4	+1 7/8	+20.0
A	MSI DATA CORP	11- 27	16 1/2	+1 1/4	+8.1
O	NETWORK SYSTEMS CORP	14- 25	23 1/8	+3 1/2	+17.6
O	OMEX	3- 8	3	- 1/2	-14.2
N	PARADYNE CORP	24- 52	33 7/8	+5 3/4	+20.4
A	PENRIL CORP	7- 17	9 3/4	+1 5/8	+20.0
O	RAMTEK CORP	9- 23	14 1/2	+2 1/4	+10.3
N	RECOGNITION EQUIP	4- 21	4 3/8	0	0.0
O	SCAN DATA	1- 5	1 1/4	- 1/8	-9.0
N	STORAGE TECHNOLOGY	16- 40	19 7/8	+2 1/8	+11.9
O	SYKES DATATRONICS	8- 34	15	+2 1/4	+17.6
A	T BAR INC	7- 19	7 5/8	+ 3/4	+10.9
A	TEC INC	4- 11	8 7/8	3/8	-4.0
N	TEKTRONIX INC	36- 70	40 1/8	+3 5/8	+9.9
N	TELEX	5- 10	9 1/2	+1 3/8	+16.9
O	TESDATA SYSTEMS CP	3- 17	3 3/4	+ 1/4	+7.1
A	TIMEPLEX INC	7- 19	9 3/4	+1 1/8	+13.0
O	VISUAL TECHNOLOGY	9- 15	10 1/2	+1	+10.5
O	WILTEK INC	1- 3	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1981-82 RANGE (1)	CLOSE AUG 25 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 17	13 1/8	+ 1/8	+0.9
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	14- 24	15 1/2	+ 3/4	+5.0
O	CYBERMATICS INC	1- 2	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	14	+ 3/8	+2.7
N	ENNIS BUS. FORMS	15- 23	22 1/2	+2 1/4	+11.1
N	3M COMPANY	48- 65	59 1/4	+4	+7.2
O	MOORE CORP LTD	26- 38	31 5.8	+1 5/8	+5.4
N	NASHUA CORP	9- 33	10	+1	+11.1
O	STANDARD REGISTER	30- 46	46	+1 1/2	+3.3
A	TAB PRODUCTS CO	12- 30	14 1/4	+1 1/4	+9.6
N	WALLACE BUS FORMS	22- 36	32 3/8	+1 7/8	+6.1

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